Vol. 929 Number 1

OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

December 3, 1974

U. S. DEPARTMENT OF COMMERCE
Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

December 3, 1974 Volume 929 Number 1

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PATENT NOTICES

Board of Appeals Decisions Rendered in the Month of October 1974

Examiner affirmed	218
Examiner affirmed in part	33
Examiner reversed	78
Total	329

Examination

Pursuant to the provisions of Rule 341(c), an examination for persons seeking registration before the United States Patent Office as patent attorneys or agents will be held on Tuesday, March 4, 1975.

With the exception of those former patent examiners for whom the examination is waived, all persons recognized for practice before the Patent Office in patent cases must, pursuant to the noted rule, pass the examination. Those passing the examination do not thereby qualify for recognition for practice before the Patent Office in trademark cases. Recognition for practice in trademark cases is governed by Rule 2.12 of the Trademark Rules of Practice, which does not require the passing of an examination.

The examination will be given under the supervision of the Civil Service Commission, and may be taken in any of the cities in which the Civil Service Commission regularly conducts examinations. Applications to take the examination must be filed in the Patent Office together with a $35 fee not later than January 31, 1975.

Application blanks may be obtained from the clerk of the Patent Office Committee on Enrollment, Bldg. 3, 11th floor, Room C16, Crystal Plaza, Arlington, Va., or by mail addressed to the Commissioner of Patents, Washington, D.C., 20231, and directed to the attention of the clerk of the Committee on Enrollment.

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,047,196, Levine and Phillips, GARMENT HANGER, **filed** July 8, 1974, D.C. Mass. (Boston), Doc. No. 74–2567–F, *Warbern Packaging Industries, Inc.* v. *Jen-Tee Plastic Inc.*; **filed** Sept. 12, 1974, D.C.N.J. (Trenton), Doc. No Civil 74–1414, *Warbern Packaging Industries, Inc.* v. *The Harwood Company, Inc.*

3,053,700, E. F. Kulp, METHOD FOR CLEANING FLOORS IN TEXTILE MILLS, **filed** Sept. 16, 1974, D.C., W.D.N.C. (Charlotte), Doc. No. C–C–74–200, *Parks-Cramer Company* v. *American Chain & Cable Co., Inc., John J. Mikell, doing business as Mikell Equipment Company and Robert L. Black, Jr.*

3,055,988, B. B. Bauer, MAGNETIC PHONOGRAPH PICKUP; **3,077,521,** Ahrens, Kuhn and Richter, STEREOPHONIC MOVING MAGNET PHONOGRAPH PICKUP; **3,077,522,** Gunter and Anderson, STEREOPHONIC PICKUP CARTRIDGE, **filed** Aug. 29, 1974, D.C., S.D. Fla. (Miami), Doc. 74–1092–C–JE, *Shure Brothers, Incorporated* v. *Walder Electronic Distributors Co.*

3,077,521. (See 3,055,988.)

3,077,522. (See 3,055,988.)

3,088,015, Cone and Horwitt, ELECTRIC CIGAR LIGHTER; **3,433,928,** L. G. Horwitt, CIGAR LIGHTER, **filed** Oct. 30, 1972, D.C., N.D. Ill. (Chicago), Doc. 72–C–2733, *Casco Prod. Corp.* v. *Nissan Motor Co. et al.* Cause dismissed without prejudice, entered July 16, 1974.

3,115,207, A. M. Wiggins, UNIDIRECTIONAL MICROPHONE, **filed** Sept. 1, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2185, *Electro-Voice Inc.* v. *Shure Brothers Inc.*, Order cause dismissed without prejudice pursuant to stipulation Sept. 5, 1974.

3,142,349, S. B. Blodgett, DYNAMICALLY COMPENSATED WEIGHING SCALES; **3,342,225,** same, AUTOMATIC FEED CONTROL SYSTEM; **3,643,752,** same, METHOD AND APPARATUS FOR CONTROLLING PRODUCT CHARGE WEIGHTS, **filed** Sept. 10, 1974, D.C., S.D. Tex. (Houston), Doc. CA 74–H–1243, *International Business Machines Corp.* v. *Mira-Pak, Inc.*

3,250,189, H. Peletz, CATCH BASIN, **filed** Aug. 29, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–2523, *Santa Rosa Cast Products Company* v. *Associated Concrete Products, Inc.*

3,269,565, Krakauer and Verbeke, ARTICLE VENDING MACHINE; **3,344,953,** same, ARTICLE VENDING MACHINE HAVING HELICAL FEEDER COIL, **filed** Aug. 19, 1974, D.C. Md. (Baltimore), Doc. B–74–905, *Merrill Krakauer* v. *UMC Industries, Inc.*

3,806,465, F. P. Brennan, WARDROBE HANGER BAR WITH CAP LOCKING MEANS, **filed** Sept. 23, 1974, D.C., E.D. Pa. (Philadelphia), Doc. CA 74–2459, *Francis P. Brennan* v. *Hardware and Industrial Company, Inc.*

3,310,435, Robinson, Jr., Steelman, Jr., and Perkins, Jr., PROCESS FOR CONTINUOUS PICKLING OF STEEL STRIP AND REGENERATION OF THE CONTACT ACID; **3,445,284,** Same, PROCESS FOR PICKLING OF STEEL STRIP AND REGENERATION OF THE CONTACT ACID; **3,669,623,** Allison, Hatfield and Frumerman, METHOD FOR THE REGENERATION OF HYDROCHLORIC ACID FROM SPENT PICKLE LIQUOR AND LIKE SOLUTIONS, **filed** Sept. 4, 1974, D.C., W.D. Pa. (Pittsburgh), Doc. CA 74–840, *Dravo Corporation* v. *Pennsylvania Engineering Corporation.*

3,342,225. (See 3,142,349.)

3,344,953. (See 3,269,595.)

3,395,273, H. S. Orton, ELECTRIC RESISTANCE FURNACE, **filed** Dec. 6, 1971, D.C., W.D. Pa. (Pittsburgh), Doc. 71–1148–C.A., *Harold S. Orton* v. *Robicon Corporation and Jeannettee Corporation.* Ordered that judgment is granted for defendants upon the complaint of plaintiff and the plaintiff's complaint is hereby dismissed and the judgment is granted defendants on its counterclaim of invalidity, July 12, 1974.

3,433,928. (See 3,088,015.)

3,445,284. (See 3,310,435.)

3,544,267, G. R. Dychdala, CALCIUM HYPOCHLORITE PRODUCT; **3,645,905,** Dychdala and Cox, CALCIUM HYPOCHLORITE MANUFACTURE, **filed** Sept. 13, 1974, D.C., E.D. Pa. (Philadelphia), Doc. C.A. 74–2379, *Olin Corporation* v. *Pennwalt Corporation.*

3,544,267, G. R. Dychdala, CALCIUM HYPOCHLORITE PRODUCT, **filed** Aug. 2, 1974, D.C., E.D. Tenn. (Knoxville), Doc. C–3–74–229, *Pennwalt Corporation* v. *Olin Corporation.*

3,546,581, F. L. Winterburn, IGNITION SYSTEM, **filed** Sept. 9, 1974, D.C. Colo. (Denver) Doc. 74–A–819, *Frederick L. Winterburn* v. *Tri Star Corporation, also known as Tri-Star Corporation.*

3,574,070, C. Sahely, METAL PLATING OVER PLASTIC; **3,615,732,** Shipley, Jr., Shipley, Gulla and Dutkewych, ELECTROLESS COPPER PLATING; **3,728,137,** same, **filed** Sept. 12, 1974, D.C. Conn. (Hartford), Doc. H–74–282, *Shipley Co. Inc.* v. *MacDermid Corporation.*

3,615,732. (See 3,574,070.)

3,643,752. (See 3,142,349.)

3,645,905. (See 3,544,267.)

3,669,623. (See 3,310,435.)

3,681,067, H. A. Girard, CORE TRANSFER PROCESS, **filed** Aug. 28, 1974, D.C., W.D.N.C. (Charlotte), Doc. C–C–74–185, *Gaston County Dyeing Machine Co.* v. *Technical Equipment Company of Gastonia, Inc. and Herbert A. Girard.*

3,728,137. (See 3,574,070.)

3,814,388, P. Jakob, DYEING PROCESS FOR SYNTHETIC MATERIALS, **filed** June 28, 1974, D.C.N.J. (Newark), Doc. 74–980, *Colortronic Reinhard & Co. KG* v. *Foremost Machine Builders, Inc.*

D. 227,503, G. E. Raymond, MOBILE PHOTOCOPY CAMERA UNIT, **filed** Sept. 17, 1974, D.C.N.J. (Newark), Doc. C–74–1442, *Gary E. Raymond* v. *M.P. Goodkin Co.*

Certificates of Correction for the Week of Dec. 3, 1974

Re. 27,935	3,742,092	3,786,285	3,806,701	3,819,684	3,826,931	3,831,872	3,836,187
Re. 28,020	3,742,248	3,786,445	3,807,043	3,819,687	3,826,937	3,831,890	3,836,228
Re. 28,056	3,742,557	3,786,686	3,807,548	3,819,915	3,826,970	3,831,940	3,836,257
Re. 28,084	3,743,010	3,787,215	3,807,750	3,820,105	3,827,036	3,832,007	3,836,330
Re. 28,086	3,745,264	3,787,239	3,807,815	3,820,234	3,827,242	3,832,050	3,836,369
Re. 28,090	3,746,696	3,787,612	3,807,868	3,820,700	3,827,260	3,832,099	3,836,470
Re. 28,095	3,746,982	3,787,787	3,808,455	3,820,729	3,827,302	3,832,125	3,836,525
Re. 28,167	3,750,300	3,788,477	3,808,633	3,820,742	3,827,373	3,832,148	3,836,790
D. 231,513	3,750,356	3,788,782	3,808,969	3,820,824	3,827,456	3,832,206	3,836,804
D. 231,518	3,753,854	3,788,882	3,809,294	3,820,901	3,827,500	3,832,255	3,836,845
D. 232,076	3,754,701	3,789,353	3,809,513	3,821,004	3,827,529	3,832,437	3,836,859
D. 232,541	3,755,212	3,790,028	3,809,610	3,821,010	3,827,617	3,832,448	3,836,917
D. 232,717	3,756,243	3,790,078	3,809,786	3,821,311	3,827,678	3,832,537	3,837,012
3,481,806	3,757,943	3,790,443	3,809,835	3,821,363	3,827,826	3,832,699	3,837,128
3,522,950	3,758,542	3,790,910	3,810,082	3,821,429	3,827,854	3,832,748	3,837,233
3,541,265	3,760,032	3,791,475	3,810,182	3,821,696	3,828,064	3,832,822	3,837,241
3,546,295	3,761,571	3,791,625	3,810,503	3,821,856	3,828,090	3,832,984	3,837,415
3,554,360	3,764,338	3,791,737	3,810,509	3,822,157	3,828,198	3,833,018	3,837,426
3,573,807	3,764,489	3,792,173	3,810,715	3,822,338	3,828,253	3,833,058	3,837,476
3,583,340	3,765,886	3,792,766	3,810,732	3,822,406	3,828,299	3,833,090	3,837,508
3,587,128	3,765,964	3,792,796	3,810,747	3,822,511	3,828,316	3,833,151	3,837,636
3,595,897	3,766,003	3,792,979	3,810,781	3,822,617	3,828,348	3,833,201	3,837,691
3,603,988	3,766,555	3,793,345	3,810,804	3,822,659	3,828,764	3,833,277	3,837,804
3,615,519	3,766,581	3,793,388	3,810,952	3,822,994	3,828,800	3,833,324	3,838,002
3,634,508	3,767,221	3,793,410	3,811,487	3,823,005	3,828,905	3,833,388	3,838,021
3,656,932	3,767,412	3,793,758	3,811,873	3,823,096	3,829,128	3,833,435	3,838,222
3,663,560	3,767,653	3,794,696	3,811,954	3,823,133	3,829,211	3,833,524	3,838,234
3,664,261	3,767,660	3,794,831	3,812,032	3,823,170	3,829,240	3,833,565	3,838,291
3,665,638	3,768,276	3,795,939	3,812,060	3,823,365	3,829,257	3,833,601	3,838,303
3,666,778	3,769,289	3,796,814	3,812,385	3,823,370	3,829,271	3,833,624	3,838,363
3,673,182	3,769,390	3,797,311	3,812,531	3,823,375	3,829,356	3,833,632	3,838,427
3,674,558	3,769,438	3,797,562	3,812,659	3,823,386	3,829,376	3,833,651	3,838,499
3,678,106	3,769,857	3,797,735	3,812,897	3,823,730	3,829,417	3,833,769	3,838,597
3,678,942	3,769,945	3,798,164	3,813,042	3,823,751	3,829,425	3,833,772	3,838,763
3,682,642	3,770,421	3,798,175	3,813,060	3,823,975	3,829,634	3,833,856	3,838,779
3,682,949	3,770,516	3,798,809	3,814,307	3,724,097	3,829,817	3,834,093	3,838,865
3,685,993	3,772,345	3,799,831	3,814,556	3,824,186	3,829,850	3,834,162	3,838,921
3,691,112	3,772,947	3,799,860	3,814,652	3,824,413	3,830,104	3,834,303	3,838,931
3,692,206	3,773,632	3,799,916	3,814,953	3,824,509	3,830,155	3,834,467	3,839,019
3,694,141	3,773,732	3,800,192	3,815,129	3,824,610	3,830,216	3,834,541	3,839,171
3,694,265	3,773,800	3,800,869	3,815,820	3,824,666	3,830,261	3,834,789	3,839,288
3,701,203	3,774,807	3,800,965	3,816,061	3,824,831	3,830,266	3,834,812	3,839,297
3,711,574	3,775,303	3,801,684	3,816,143	3,824,840	3,830,447	3,834,948	3,839,369
3,715,508	3,775,535	3,801,926	3,816,482	3,824,862	3,830,465	3,834,983	3,839,381
3,717,616	3,775,964	3,802,332	3,816,574	3,824,884	3,830,523	3,835,029	3,839,401
3,718,642	3,776,867	3,802,474	3,816,639	3,824,987	3,830,647	3,835,037	3,839,509
3,719,292	3,777,585	3,802,811	3,816,676	3,824,989	3,830,706	3,835,153	3,839,525
3,720,249	3,778,294	3,802,859	3,816,816	3,825,161	3,830,795	3,835,174	3,839,542
3,720,312	3,778,968	3,803,020	3,817,240	3,825,198	3,830,818	3,835,179	3,839,548
3,723,439	3,779,133	3,803,088	3,817,427	3,825,208	3,830,826	3,835,217	3,839,551
3,724,106	3,779,167	3,803,185	3,817,698	3,825,297	3,830,874	3,835,240	3,839,634
3,724,168	3,781,323	3,803,605	3,817,732	3,825,348	3,830,881	3,835,259	3,839,646
3,725,301	3,781,504	3,803,628	3,817,772	3,825,358	3,830,905	3,835,312	3,839,660
3,725,918	3,781,585	3,803,700	3,817,811	3,825,526	3,831,000	3,835,321	3,839,676
3,727,433	3,782,159	3,803,703	3,817,916	3,825,557	3,831,053	3,835,327	3,839,731
3,727,942	3,782,917	3,803,988	3,818,295	3,825,576	3,831,073	3,835,402	3,839,956
3,730,441	3,783,346	3,804,274	3,818,308	3,825,636	3,831,177	3,835,524	3,840,169
3,734,702	3,783,390	3,804,963	3,818,446	3,825,683	3,831,434	3,835,543	3,840,205
3,734,717	3,783,391	3,805,043	3,818,453	3,825,690	3,831,483	3,835,641	3,840,218
3,738,097	3,783,706	3,805,135	3,818,465	3,825,733	3,831,492	3,835,799	3,840,249
3,738,365	3,784,471	3,805,849	3,818,495	3,826,008	3,831,552	3,835,822	3,840,421
3,739,384	3,784,545	3,806,416	3,818,580	3,826,186	3,831,681	3,835,962	3,840,936
3,739,652	3,784,881	3,806,500	3,818,676	3,826,233	3,831,686	3,835,991	3,841,467
3,740,186	3,785,390	3,806,559	3,819,520	3,826,334	3,831,773	3,836,124	3,841,649
3,741,216	3,785,430	3,806,582	3,819,523	3,826,648	3,831,823	3,836,183	3,841,978

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the licensing policy of each Agency-sponsor.

Copies of Patent applications, either paper copy (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22151, at the prices cited. Requests for copies of patent applications must include the patent application number and the title.

Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at $0.50 each.

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DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. ATOMIC ENERGY COMMISSION
Assistant General Counsel for Patents,
Washington, D.C. 20545

Patent application 438,083. Temperature Sensor. Filed Jan. 30, 1974, PC $4/MF $1.45.

Patent application 443,078. Improved Collection Ring for Use in Multiple-Sample Blood Fractionation Centrifugal Rotors. Filed Feb. 15, 1974. PC $4/MF $1.45.

Patent 3,780,290. Radiation Camera Motion Correction System. Filed Mar. 28, 1972. Patented Dec. 18, 1973. Not available NTIS.

DEPARTMENT OF THE AIR FORCE AF/JACP
Washington, D.C. 20314

Patent application 344,789. Process and Apparatus for Large Scale Extrusions. Filed Mar. 26, 1973. PC $4.25/MF $1.45.

Patent application 409,972. Encapsulated Pellet Igniter Charge. Filed Nov. 5, 1973. PC $4/MF $1.45.

Patent application 433,175. Multi-Channel Sun Photometer. Filed Jan. 14, 1974. PC $4/MF $1.45.

Patent application 439,666. Short Depth Hardened Wave Guide Element. Filed Feb. 4, 1974. PC $4/MF $1.45.

Patent application 439,672. Strip Exposure Apparatus for Nucleation Medium. Filed Feb. 4, 1974. PC $4/MF $1.45.

Patent application 442,296. Integral Aircraft Barrier Net. Filed Feb. 13, 1974. PC $4/MF $1.45.

Patent application 445,004. Laser Site Marking System. Filed Feb. 22, 1974. PC $4/MF $1.45.

Patent application 445,046. Method of Fabricating Silicon Carbide Articles. Filed Feb. 22, 1974. PC $4/MF $1.45.

Patent application 445,047. Improved Outer Seal for First Stage Turbine. Filed Feb. 22, 1974. PC $4/MF $1.45.

Patent application 445,048. Method and Apparatus for Providing Higher Order Mode Compensation in Horn Antennas. Filed Feb. 22, 1974. PC $4/MF $1.45.

Patent application 445,049. Method and Apparatus for Providing Higher Order Mode Compensation in Horn Antennas. Filed Feb. 22, 1974. PC $4/MF $1.45.

Patent application 447,423. Wrapped Laminated Felted Monolithic Combustible Cartridge Case. Filed Mar. 1, 1974. PC $4/MF $1.45.

Patent application 447,424. Synthesis of High Purity, Alpha Phase Silicon Nitride Powder. Filed Mar. 1, 1974. PC $4/MF $1.45.

Patent application 447,425. Positive, Reuseable Bolt Lock Assembly. Filed Mar. 1, 1974. PC $4/MF $1.45

Patent application 452,038. Method for Fabricating Silicon Nitride Bodies. Filed Mar. 18, 1974. PC $4/ $1.45.

U.S. DEPARTMENT OF AGRICULTURE
Chief, Research Agreements and Patent Mgmt. Branch,
Hyattsville, Md. 20782

Patent application 404,977. Method for use of a Discrete Carrier in Delivery of Precursors for Fixation Processes. Filed Oct. 10, 1973. PC $4/MF $1.45.

Patent application 404,978. Cellulose Terpolymer Textiles. Filed Oct. 10, 1973. PC $4/MF $1.45.

Patent application 432,801. Flame Retardation of Textiles by Crosslinking Halo Phosphorus Compounds With Polyethyleniimine. Filed Jan. 11, 1974. PC $4/MF $1.45.

Patent 3,153,597. Polymeric Dialdehyde-Protein Adhesives and Wood Laminates Therewith. Filed Nov. 16, 1961. Patented Oct. 20, 1964. Not available NTIS.

Patent 3,400,107. Carbohydrate Derived Polymers. Filed June 16, 1965. Patented Sept. 3, 1968. Not available NTIS.

Patent 3,794,466. Single Bath Chromic Chloride Mineral Dyeing Process for Celluiosics. Filed Apr. 27, 1972. Patented Feb. 26, 1974. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, Washington, D.C. 20240

Patent application 383,431. Injector Apparatus and Plug for Retention of Liquids Under Pressure. Filed July 27, 1973. PC $4/MF $1.45.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters,
Washington, D.C. 20546

Patent application 426,405. Vapor Phase Growth of Groups III-V Compounds by Hydrogen Chloride Transport of the Elements. Filed Dec. 19, 1973. PC $4/MF $1.45.

Patent application 436,316. Rocket Chamber and Method of Making. Filed Jan. 24, 1974. PC $4/MF $1.45.

Patent application 474,745. Quick Disconnect Filter Coupling. Filed May 30, 1974. PC $4/MF $1.45.

Patent application 478,900. Mixing Insert for Foam Dispensing Apparatus. Filed June 12, 1974. PC $4/MF $1.45.

Patent 3,812,783. Optically Detonated Explosive Device. Patented May 28, 1974. Not available NTIS.

Patent 3,814,350. Thrust-Isolating Mounting. Patented June 4, 1974. Not available NTIS.

Patent 3,814,653. Method of Laminating Structural Members. Patented June 4, 1974. Not available NTIS.

Patent 3,815,048. LC-Oscillator With Automatic Stabilized Amplitude Via Bias Current Control. Patented June 4, 1974. Not available NTIS.

Patent 3,819,530. Intumescent Composition, Foamed Product Prepared Therewith and Process for Making Same. Patented June 25, 1974. Not available NTIS.

Patent 3,820,918. Supersonic Fan Blading. Patented June 28, 1974. Not available NTIS.

U.S. ATOMIC ENERGY COMMISSION
Assistant General Counsel for Patents
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Patent application 440,627. Hydrogen Detector for Sodium Cooled Reactors. Filed Feb. 7, 1974. PC $4/MF $1.45.

Patent 3,776,855. Hydriding Process. Filed Sept. 14, 1965. Patented Dec. 4, 1973. Not available NTIS.

Patent 3,776,988. Cryochemical Method for Forming Spherical Metal Oxide Particles From Metal Salt Solutions. Filed Aug. 13, 1971. Patented Dec. 4, 1973. Not available NTIS.

Patent 3,777,161. Hodoscope Readout System. Filed Nov. 8, 1972. Patented Dec. 4, 1973. Not available NTIS.

Patent 3,778,300. Method of Forming Impermeable Carbide Coats on Graphite. Filed Oct. 7, 1966. Patented Dec. 11, 1973. Not available NTIS.

Patent 3,778,301. Method of Coating Graphite Tubes With Refractory Metal Carbides. Filed Apr. 28, 1967. Patented Dec. 11, 1973. Not available NTIS.

Patent 3,778,819. High-Energy Plastic-Bonded Explosive. Filed Jan. 30, 1973. Patented Dec. 11, 1973. Not available NTIS.

Patent 3,778,344. Nuclear Engine Flow Reactivity Shim Control. Filed Mar. 21, 1968. Patented Dec. 11, 1973. Not available NTIS.

Patent 3,778,369. Hemodialyzer With Tapered Slit Blood Ports and Baffles. Filed Feb. 3, 1972. Patented Dec. 11, 1973. Not available NTIS.

Patent 3,778,380. Method for Producing UO2 Loaded Refractory Metals. Filed Oct. 31, 1966. Patented Dec. 11, 1973. Not available NTIS.

Patent 3,778,500. Method of Production NaF.2UF4. Filed May 23, 1972. Patented Dec. 11, 1973. Not available NTIS.

Patent 3,779,716. Tantalum Carbide-Tantalum Fiber Composite Material. Filed Jan. 18, 1972. Patented Dec. 18, 1973. Not available NTIS.

Patent 3,779,938. Method for Processing Scrap Fissile Material Into a Form Suitable for Shipping. Filed Aug. 18, 1972. Patented Dec. 18, 1973. Not available NTIS.

Patent 3, 781,217. Method of Repressing the Precipitation of Calcium Fluozirconate. Filed July 3, 1972. Patented Dec. 25, 1973. Not available NTIS.

Patent 3,781,335. Preparation of Difluoronitroethylperfluoro Acrylate and Related Compounds. Filed Jan. 11, 1972. Patented Dec. 25, 1973. Not available NTIS.

Patent 3,781,392. Production of Sintered Porous Metal Fluoride Pellets. Filed Oct. 7, 1971. Patented Dec. 25, 1973. Not available NTIS.

Patent 3,781,612. Method of Improving High-Purity Germanium Radiation Detectors. Filed Mar. 28, 1972. Patented Dec. 25, 1973. Not available NTIS.

DEPARTMENT OF THE AIR FORCE AF/JACP
Washington, D.C. 20314

Patent application 351,120. Very High Power Shock Wave Gas Laser. Filed Apr. 16, 1973. PC $4/MF $1.45.

Patent application 452,039. Schottky Barrier Infrared Detector Arrays With Charge Coupled Device Readout. Filed Mar. 18, 1974. PC $4/MF $1.45.

Patent application 454,197. Inertial Line of Sight Guidance System for Free Falling Bodies. Filed Mar. 25, 1974. PC $4/MF $1.45.

Patent application 454,198. Hydrostatic Stress, Gauge System. Filed Mar. 25, 1974. PC $4/MF $1.45.

Patent application 455,690. Panel Grid Module Construction System. Filed Mar. 28, 1974. PC $4/MF $1.45.

Patent application 455,768. Two-Coupler Microwave Frequency Discriminator With Internal Adjustable Delay Line. Filed Mar. 28, 1974. PC $4/MF $1.45.

Patent application 456,405. Geophysical Measurement Array. Filed Mar. 29, 1974. PC $4/MF $1.45.

Patent application 456,406. Isothermal Gas Dynamic Laser Nozzle. Filed Mar. 29, 1974. PC $4/MF $1.45.

Patent application 460,229. Vibration Resistant Geiger-Mueller Tube. Filed Apr. 11, 1974. PC $5/MF $1.45.

Patent application 460,230. Zero Crossing SCR Light Dimmer. Filed Apr. 11, 1974. PC $4/MF $1.45.

Patent application 461,670. Transpiration Cooling Washer Assembly. Filed Apr. 17, 1974. PC $4/MF $1.45.

Patent application 461,671. Offset Reduction Apparatus for Analog Circuits, Filed Apr. 17, 1974. PC $4/MF $1.45.

Patent application 461,672. Method of Making Self Aligned Silicon Gate Transistors. Filed Apr. 17, 1974. PC $4/MF $1.45.

Patent application 461,673. Horizontal Loading Fixture for Sustained Load Testing. Filed Apr. 17, 1974. PC $4/MF $1.45.

Patent application 461,639. Thermally Stable, Highly Fused Quinoxaline Composition and Method of Synthesis. Filed Apr. 17, 1974. PC $4.25/MF $1.45.

U.S. DEPARTMENT OF AGRICULTURE
Chief, Research Agreements and Patent Mgmt. Branch,
Hyattsville, Maryland 20782

Patent application 374,592. Interpolymer Paper Strength Additives. Filed June 28, 1973. PC $4.25/MF $1.45.

Patent application 386,921. Epoxypropyl Starch. Filed Aug. 9, 1973. PC $4/MF $1.45.

Patent application 399,013. Process of Imparting Creasability of Cellulosic and Other Hydroxy-Containing Polymeric Fibers and Fabrics by Reaction of N-Methylol Derivatives in the Presence of Phosphorylating Agents and Products. Filed Sept. 20, 1973. PC $4/MF $1.45.

Patent application 401,773. Process for Controlling the Macromolecular Reactivities of Cotton and Mercerized Cotton. Filed Sept. 28, 1973. PC $4/MF $1.45.

Patent application 416,122. Selective Hydrocarboxylation of Unsaturated Fatty Compounds. Filed Nov. 15, 1973. PC $4.75/MF $1.45.

Patent 3,165,508. Degraded Starch Polyoxyalkylene Ether Compositions and Process for Producing the Same Filed Apr. 13, 1962. Patented Jan. 12, 1965. Not available NTIS.

Patent 3,179,717. Coating Compositions Comprising Polymers of Vinyl Ethers of Polyunsaturated Fatty Alcohols. Filed June 1, 1960. Patented Apr. 20, 1965. Not available NTIS.

Patent 3,223,683. Cross-Linked Poly- and Interpoly-(Amide-Acetals). Filed Apr. 14, 1961. Patented Dec. 14, 1965. Not available NTIS.

Patent 3,298,160. Gas-Solid Chromatography Using Column Comprising $AgNO_3$-Coated Alumina. Filed June 27, 1966. Patented Jan. 17, 1967. Not available NTIS.

Patent 3,404,136. Carbohydrate Derived Polymers. Filed June 16, 1965. Patented Oct. 1, 1968. Not available NTIS.

Patent 3,420,852. Dichloride Salts of O-Methylenated Sugar Acids. Filed June 16, 1965. Patented Jan. 7, 1969. Not available NTIS.

Patent 3,779,066. Determination of Residual Solvent in Oilseed Meals and Flours by a Volatilization Procedure. Filed Mar. 28, 1972. Patented Dec. 18, 1973. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
National Institutes of Health Chief, Patent Branch
Bethesda, Maryland 20014

Patent application 471,999. Positive Position Interlock Concealment Shutter. Filed May 21, 1974. PC $4/MF $1.45.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, Washington, D.C. 20240

Patent application 450,636. Charging an Electric Furnace. Filed Mar. 13, 1974. PC $4/MF $1.45.

Patent application 471,513. Regular Copolyamides as Desalination Membranes. Filed May 20, 1974. PC $4/MF $1.45.

Patent 3,816,303. Poly (N-Amido) Imides as Semipermeable Membranes. Filed Dec. 20, 1972. Patented June 11, 1974. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters,
Washington, D.C. 20546

Patent application 478,801. Brushless DC Motor With Wound Rotor. Filed June 12, 1974. PC $4/MF $1.45.

Patent application 478,802. G-Load Measuring and Indicator Apparatus. Filed June 12, 1974. PC $4.25/MF $1.45.

Patent application 478,803. An Improved Helium Refrigerator. Filed June 12, 1974. PC $4/MF $1.45.

Patent application 482,967. Exhaust Flow Deflector. Filed June 25, 1974. PC $4/MF $1.45.

Patent application 483,851. Dichroic Plate. Filed June 27, 1974. PC $4/MF $1.45.

Patent application 483,852. Refrigerated Coaxial Coupling. Filed June 27, 1974. PC $4/MF $1.45.

Patent application 483,853. Coating Superalloys. Filed June 27, 1974. PC $4/MF $1.45.

Patent application 484,209. Modulated Hydrogen Ion Flame Detector. Filed June 28, 1974. PC $4/MF $1.45.

Patent 3,811,429. Arterial Pulse Wave Pressure Transducer. Patented May 21, 1974. Not available NTIS.

Patent 3,812,358. Coaxial Anode Wire for Gas Radiation Counters. Patented May 21, 1974. Not available NTIS.

Patent 3,812,936. Sprag Solenoid Brake. Patented May 28, 1974. Not available NTIS.

Patent 3,813,937. Heat Flow Calorimeter. Patented June 4, 1974. Not available NTIS.

Patent 3,814,678. Electrophoretic Sample Insertion. Patented June 4, 1974. Not available NTIS.

Patent 3,815,205. Device for Configuring Multiple Leads. Patented June 11, 1974. Not available NTIS.

Patent 3,815,969. Holography Utilizing Surface Plasmon Resonances. Patented June 11, 1974. Not available NTIS.

Patent 3,816,785. Dispensing Targets for Ion Beam Particle Generators. Patented June 11, 1974. Not available NTIS.

Patent 3,817,082. Apparatus for Establishing Flow of a Fluid Mass Having a Known Velocity. Patented June 18, 1974. Not available NTIS.

Patent 3,817,084. Apparatus for Inserting and Removing Specimens From High Temperature Vacuum Furnaces. Patented June 18, 1974. Not available NTIS.

Patent 3,817,627. Specific Wavelength Colorimeter. Patented June 18, 1974. Not available NTIS.

Patent 3,818,325. Battery Testing Device. Patented June 18, 1974. Not available NTIS.

Patent 3,818,346. Differential Phase Shift Keyed Signal Resolver. Patented June 18, 1974. Not available NTIS.

Patent 3,818,767. Passive Dual Spin Misalignment Compensators. Patented June 25, 1974. Not available NTIS.

Patent 3,818,775. Concentric Differential Gearing Arrangement. Patented June 25, 1974. Not available NTIS.

Patent 3,818,814. Air Conditioning System and Component Therefor Distributing Air Flow From Opposite Directions. Patented June 25, 1974. Not available NTIS.

Patent 3,819,299. Magnetocaloric Pump. Patented June 25, 1974. Not available NTIS.

Patent 3,819,419. Steady State Thermal Radiometers. Patented June 25, 1974. Not available NTIS.

Patent 3,819,440. Technique for Recovery of Voice Data From Heat Damaged Magnetic Tape. Patented June 25, 1974. Not available NTIS.

Patent 3,819,550. Intumescent Composition. Foamed Product Prepared Therewith and Process for Making Same. Patented June 25, 1974. Not available NTIS.

Patent 3,820,095. Electric Field Measuring and Display System. Patented June 25, 1974. Not available NTIS.

Patent 3,820,286. Grinding Arrangement for Ball Nose Milling Cutters. Patented June 28, 1974. Not available NTIS.

Patent 3,820,388. Device for Measuring Tensile Forces. Patented June 28, 1974. Not available NTIS.

Patent 3,820,529. Conductive Elastomeric Extensometer. Patented June 28, 1974. Not available NTIS.

Patent 3,820,630. Jet Exhaust Noise Suppressor. Patented June 28, 1974. Not available NTIS.

Patent 3,820,918. Supersonic Fan Blading. Patented June 28, 1974. Not available NTIS.

Patent 3,821,102. Apparatus for Conducting Flow Electrophoresis in the Substantial Absence of Gravity. Patented June 28, 1974. Not available NTIS.

Patent 3,821,462. High Current Electrical Lead. Patented June 28, 1974. Not available NTIS.

Patent 3,821,546. Photomultiplier Circuit Including Means for Rapidly Reducing the Sensitivity Thereof. Patented June 28, 1974. Not available NTIS.

Patent 3,821,556. Three Mirror Glancing Incidence System for X-Ray Telescope. Patented June 28, 1974. Not available NTIS.

DEPARTMENT OF THE ARMY
Chief, Patents Division, Office of the Judge Advocate General,
Pentagon, Washington, D.C.

Patent 3,610,054. Leveling Device. Filed July 23, 1969. Patented Oct. 5, 1971. Not available NTIS.

Patent 3,614,581. Power Conversion System. Filed Feb. 10, 1970. Patented Oct. 19, 1971. Not available NTIS.

Patent 3,706,920. Tunnel Electron Emitter Cathode. Filed Mar. 18, 1971. Patented Dec. 19, 1972. Not available NTIS.

Patent 3,710,395. Air Distribution Garment. Filed Oct. 29, 1971. Patented Jan. 16, 1973. Not available NTIS.

Patent 3,712,421. Rotary Timer. Filed June 13, 1971. Patented Jan. 23, 1973. Not available NTIS.

Patent 3,715,298. Air Pollution Monitoring System. Filed Dec. 22, 1970. Patented Feb. 6, 1973. Not available NTIS.

Patent 3,716,303. Epoxy Fixturing. Filed July 1, 1970. Patented Feb. 13, 1973. Not available NTIS.

Patent 3,718,319. Apparatus and Process for Contacting Immiscible Liquids. Filed Nov. 16, 1971. Patented Feb. 27, 1973. Not available NTIS.

Patent 3,718,483. Method for Preparing Storage-Stable Bakery Products Within Hermetically Sealed Containers. Filed Nov. 18, 1970. Patented Feb. 27, 1973. Not available NTIS.

Patent 3,718,730. Method of Treating Barium Titanate. Filed June 23, 1971. Patented Feb. 27, 1973. Not available NTIS.

U.S. ATOMIC ENERGY COMMISSION
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 3,776,508. Process for Massively Hydriding Zirconium-Uranium Fuel Elements. Filed May 26, 1961. Patented Dec. 4, 1973. Not available NTIS.

Patent 3,776,697. Method and Reagent for Determining Nitrogen Oxides. Filed Apr. 13, 1972. Patented Dec. 4, 1973. Not available NTIS.

Patent 3,776,958. Nitrodifluoramino Polyaromatic Compounds. Filed Apr. 18, 1972. Patented Dec. 4, 1973. Not available NTIS.

Patent 3,778,348. Nuclear Fuel Element With Axially Aligned Fuel Pellets and Fuel Microspheres Therein. Filed July 3, 1972. Patented Dec. 11, 1973. Not available NTIS.

Patent 3,779,385. Apparatus for Removing Oil and Other Floating Contaminants From a Moving Body of Water. Filed Nov. 30, 1971. Patented Dec. 18, 1973. Not available NTIS.

Patent 3,781,556. Neutron Activation Analysis System. Filed Sept. 8, 1972. Patented Dec. 25, 1973. Not available NTIS.

DEPARTMENT OF THE AIR FORCE AF/JACP
Washington, D.C. 20314

Patent application 464,874. A Process and Apparatus for Metal Powder Consolidation. Filed Apr. 29, 1974. PC $4/MF $1.45.

Patent application 464,875. Method and Apparatus for Focusing an Electron Beam. Filed Apr. 29, 1974. PC $4/MF $1.45.

Patent application 464,876. Blended Manual-Automatic Control System. Filed Apr. 24, 1974. PC $4.25/MF $1.45.

Patent application 465,711. Heated Die Assembly. Filed Apr. 30, 1974. PC $4/MF $1.45.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters
Washington, D.C. 20546

Patent 3,817,084. Apparatus for Inserting and Removing Specimens From High Temperature Vacuum Furnaces. Patented June 18, 1974. Not available NTIS.

Patent 3,818,767. Passive Dual Spin Misalignment Compensators. Patented June 25, 1974. Not available NTIS.

Patent 3,818,814. Air Conditioning System and Component Therefor Distributing Air Flow From Opposite Directions. Patented June 25, 1974. Not available NTIS.

Patent 3,819,299. Magnetocaloric Pump. Patented June 25, 1974. Not available NTIS.

Patent 3,819,440. Technique for Recovery of Voice Data From Heat Damaged Magnetic Tape. Patented June 25, 1974. Not available NTIS.

Patent 3,819,550. Intumescent Composition, Foamed Product Prepared Therewith and Process for Making Same. Patented June 25, 1974. Not available NTIS.

Patent 3,820,630. Jet Exhaust Noise Suppressor. Patented June 28, 1974. Not available NTIS.

Patent 3,820,918. Supersonic Fan Blading. Patented June 28, 1974. Not available NTIS.

Patent 3,821,102. Apparatus for Conducting Flow Electrophoresis in the Substantial Absence of Gravity. Patented June 28, 1974. Not available NTIS.

U.S. ATOMIC ENERGY COMMISSION
Assistant General Counsel for Patents,
Washington, D.C. 20545

Patent application 438,148. Precise Carbon Control of Fabricated Stainless Steel. Filed Jan. 29, 1974. PC $4/MF $1.45.

Patent application 445,740. Gold-Platinum Plating Bath. Filed Feb. 25, 1974. PC $4/MF $1.45.

Patent application 446,067. Device for Sampling Exhaust Stack Effluent. Filed Feb. 26, 1974. PC $4/MF $1.45.

Patent application 448,312. Method for Reducing Viscosity of Shale Oil. Filed Mar. 5, 1974. PC $4/MF $1.45.

U.S. DEPARTMENT OF THE AIR FORCE AF/JACP
Washington, D.C. 20314

Patent application 334,504. Impingement Cooled Turbine Blade. Filed Feb. 22, 1973. PC $4/MF $1.45.

Patent application 340,810. Tunable Off Resonant Optically Pumped Laser. Filed Mar. 13, 1973. PC $4/MF $1.45.

Patent application 423,845. Low Pressure Test for Reservoir Level System. Filed Dec. 11, 1973. PC $4/MF $1.45.

Patent application 423,853. Isolating-Oscillating Piston Pump. Filed Dec. 11, 1973. PC $4/MF $1.45.

Patent application 423,856. Paddle Wheel Diffuser. Filed Dec. 11, 1973. PC $4/MF $1.45.

Patent application 423,857. Method and Apparatus for Growing Crystals. Filed Dec. 11, 1973. PC $4/MF $1.45.

Patent application 427,285. Thermal Tempering of Non-Oxide Glass Compositions. Filed Dec. 21, 1973. PC $4/MF $1.45.

Patent application 427,287. Bandwidth-Limited, Cavity-Dumped, Laser System. Filed Dec. 21, 1973. PC $4/MF $1.45.

Patent application 427,288. Optically Transparent Magnesium Oxide. Filed Dec. 21, 1973. PC $4/MF $1.45.

Patent application 431,180. Reverse Flow AFT Inlet Ramjet System. Filed Jan. 7, 1974. PC $4.50/MF $1.45.

Patent application 431,186. Integral Rocket/Ramjet Propulsion System With Axial Admission Ports. Filed Jan. 7, 1974. PC $4/MF $1.45.

Patent application 431,198. Method of Encapsulation. Filed Jan. 7, 1974. PC $4/MF $1.45.

Patent application 433,179. Magnetic Surface Wave Rotation Rate Sensor. Filed Jan. 14, 1974. PC $4/MF $1.45.

Patent application 433,180. Acoustic Surface Wave Frequency Synthesizer. Filed Jan. 14, 1974. PC $4/MF $1.45.

Patent application 434,154. A Valve System for Confined Vortex Flow System. Filed Jan. 17, 1974. PC $4/MF $1.45.

Patent application 436,562. Digital Test Apparatus. Filed Jan. 25, 1974. PC $4/MF $1.45.

Patent application 439,661. High Speed Electronic Channel Discriminator. Filed Feb. 4, 1974. PC $4/MF $1.45.

Patent application 439,662. Simultaneous CO and CO_2 Laser. Filed Feb. 4, 1974. PC $4/MF $1.45.

Patent application 439,663. Laser Doppler Velocimeter. Filed Feb. 4, 1974. PC $4/MF $1.45.

Patent application 439,664. Two-Dimensional Bragg Cell. Filed Feb. 4, 1974. PC $4/MF $1.45.

Patent application 439,667. Short Range Moving Target Noise Signal Radar System. Filed Feb. 4, 1974. PC $4/MF $1.45.

Patent application 439,670. Multichannel Microwave Filter. Filed Feb. 4, 1974. PC $4/MF $1.45.

Patent application 442,300. Device for Simulating Reentry Conditions in a Particle Laden Atmosphere. Filed Feb. 13, 1974. PC $4/MF $1.45.

Patent application 442,301. Incendiary Composition. Filed Feb. 13, 1974. PC $4/MF $1.45.

U.S. DEPARTMENT OF AGRICULTURE
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Federal Bldg., Hyattsville, Md. 20782

Patent application 437,095. Co-Distillation Method for Recovering Volatile Flavor Compounds From Citrus Essence Oils. Filed Feb. 28, 1974. PC $4/MF $1.45.

Patent application 437,096. Flame-Retardent Textiles by Reaction of Cellulose With the Adduct of Phosphorus Trichloride and N,N-Dimethylformamide. Filed Jan. 28, 1974. PC $4.25/MF $1.45.

Patent 3,119,850. Linolenate-Derived Cyclic Monomer Fraction. Filed May 17, 1962. Patented Jan. 28, 1964. Not available NTIS.

Patent 3,140,191. Linseed Oil Emulsion Compositions Comprising Dipicolinate and Linseed Oil-Derived Emulsifiers. Filed Nov. 14, 1960. Patented July 7, 1964. Not available NTIS.

Patent 3,160,552. Cellulosic Pulps Comprising Crosslinked Xanthate Cereal Pulps and Products Made Therewith. Filed Mar. 14, 1962. Patented Dec. 8, 1964. Not available NTIS.

Patent 3,169,073. High Solids Protein-Polymeric Dialdehyde Coating Compositions. Filed Nov. 16, 1961. Patented Feb. 9, 1965. Not available NTIS.

Patent 3,173,792. Method of Obtaining Detoxified Meal From Seeds Containing Both Isothiocyanate and Thiooxazolidone. Filed Mar. 2, 1962. Patented Mar. 16, 1965. Not available NTIS.

Patent 3,218,307. Process for Producing Soybean Proteinate. Filed Aug. 1, 1961. Patented Nov. 16, 1965. Not available NTIS.

Patent 3,230,213. Preparation of Aminoguanidine Derivatives. Filed July 19, 1962. Patented Jan. 18, 1966. Not available NTIS.

Patent 3,251,826. Cationic Oxidized Starch Products. Filed Feb. 8, 1962. Patented May 17, 1966. Not available NTIS.

Patent 3,771,202. Method for Electrostatic Yarn Bulking and Impregnating. Filed Sept. 29, 1972. Patented Nov. 13, 1973. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Bethesda, Md. 20014

Patent 3,819,726. Preparation of Urushiol From Poison Ivy or Poison Oak. Filed July 24, 1972. Patented June 25, 1974. Not available NTIS.

U.S. DEPARTMENT OF INTERIOR
Branch of Patents, 18th and C Streets, NW.
Washington, D.C. 20240

Patent application 477,229. Recovery of Copper From Chalcopyrite Ore Concentrates. Filed June 7, 1974. PC $4/MF $1.45.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

Patent application 428,993. Fluorescence Detector for Monitoring Atmospheric Pollutants. Filed Dec. 27, 1973. PC $4/MF $1.45.

Patent application 462,705. A Multitarget Sequential Sputtering Apparatus. Filed Apr. 22, 1974. PC $4.25/MF $1.45.

Patent application 472,775. Self-Supporting Strain Transducer. Filed May 23, 1974. PC $4/MF $1.45.

Patent application 473,973. Wingtip Vortex Dissipator for Aircraft. Filed May 24, 1974. PC $4/MF $1.45.

Patent application 474,744. Shock Position Sensor for Supersonic Inlets. Filed May 30, 1974. PC $4/MF $1.45.

Patent application 475,337. Improved Method of Detecting and Counting Bacteria. Filed May 31, 1974. PC $4/MF $1.45.

Patent 3,812,924. Device for Monitoring a Change in Mass in Varying Gravimetric Environments. Patented May 28, 1974. Not available NTIS.

Patent 3,813,183. Insert Facing Tool. Patented May 28, 1974. Not available NTIS.

Patent 3,813,875. Rocket Having Barium Release System to Create Ion Clouds in the Upper Atmosphere. Patented June 4, 1974. Not available NTIS.

Patent 3,814,083. Apparatus and Method for Processing Korotkov Sounds. Patented June 4, 1974. Not available NTIS.

Patent 3,814,939. Chromato-Fluorographic Drug Detector. Patented June 4, 1974. Not available NTIS.

Patent 3,815,109. Miniature Multichannel Biotelemeter System. Patented June 4, 1974. Not available NTIS.

Patent 3,816,657. Differential Phase Shift Keyed Communication System. Patented June 11, 1974. Not available NTIS.

DEPARTMENT OF THE ARMY

Chief, Patents Division, Office of the Judge ,Advocate General
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Patent 3,718,932. Combined Multi-Polarization Loopstick and Whip Antenna. Filed June 1, 1971. Patented Feb. 27, 1973. Not available NTIS.

Patent 3,726,645. Inert Plastic Film for Support and Packaging of Chemical Spot Test Systems. Filed July 6, 1970. Patented Apr. 10, 1973. Not available NTIS.

Patent 3,726,693. Dehydrated Food Coated With Edible Oil, Gelatin, Glycerine Aqueous Emulsion. Filed Dec. 22, 1970. Patented Apr. 10, 1973. Not available NTIS.

Patent 3,726,773. Surface Preparation of Maraging Steel for Electroplating. Filed Aug. 2, 1971. Patented Apr. 10, 1973. Not available NTIS.

Patent 3,730,502. Apparatus for Vacuum Brazing-Gas Quenching Non-Ferrous and Ferrous Alloys. Filed May 21, 1971. Patented May 1, 1973. Not available NTIS.

Patent 3,731,505. One-Out-Of-Two Lock Systems. Filed Dec. 16, 1971. Patented May 8, 1973. Not available NTIS.

Patent 3,731,646. Explosive Embedment Anchor Projectile. Filed Aug. 6, 1970. Patented May 8, 1973. Not available NTIS.

Patent 3,731,979. Brake Anti-Skid System. Filed Mar. 19, 1971. Patented May 8, 1973. Not available NTIS.

Patent 3,732,412. Method and System for Personnel Control With Blinding Illumination. Filed June 13, 1972. Patented May 8, 1973. Not available NTIS.

Patent 3,771,418. Anti-Spall Lightweight Armor. Filed Sept. 29, 1971. Patented Nov. 13, 1973. Not available NTIS.

U.S. ATOMIC ENERGY COMMISSION

Assistant General Counsel for Patents,
Washington, D.C. 20545

Patent application 443,262. Noble Gas Adsorption Process. Filed Feb. 19, 1974. PC $4/MF $1.45.

Patent application 444,457. Switch Actuator. Filed Feb. 21, 1974. PC $4/MF $1.45.

Patent 3,229,759. Evaporation-Condensation Heat Transfer Device. Filed Dec. 2, 1963. Patented Jan. 18, 1966. Not available NTIS.

Patent 3,775,842. Method for Centering and Restraining Coils in an Electromagnet. Filed Aug. 16, 1972. Patented Dec. 4, 1973. Not available NTIS.

Patent 3,776,026. Ultrasonic Flaw Determination by Spectral Analysis. Filed Aug. 8, 1972. Patented Dec. 4, 1973. Not available NTIS.

Patent 3,777,176. Active Crowbar for a Switching Magnet. Filed July 5, 1972. Patented Dec. 4, 1973. Not available NTIS.

Patent 3,778,295. Chemical Plating Method of Preparation Radiation Source Material. Filed Mar. 8, 1972. Patented Dec. 11, 1973. Not available NTIS.

Patent 3,778,343. Device for Plasma Confinement and Heating by High Currents and Nonclassical Plasma Transport Properties. Filed Mar. 11, 1971. Patented Dec. 11, 1973. Not available NTIS.

Patent 3,778,627. High Intensity, Pulsed Thermal Neutron Source. Filed Apr. 17, 1973. Patented Dec. 11, 1973. Not available NTIS.

Patent 3,779,864. External Control of Ion Waves in a Plasma by High Frequency Fields. Filed Oct. 29, 1971. Patented Dec. 18, 1973. Not available NTIS.

Patent 3,781,173. Method for Providing Metallic Carbide Coating on Graphite. Filed Jan. 12, 1971. Patented Dec. 25, 1973. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Chief, Research Agreements & Patent Mgmt. Branch General Services Division, Hyattsville, Md. 20782

Patent 3,768,965. Activated Single Bath Pearl Gray Chrome Green Mineral Dyeing and Composition Therefor. Filed Aug. 31, 1971. Patented Oct. 30, 1973. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th & C Streets, NW.,
Washington, D.C. 20240

Patent application 420,509. Angular Deviation Measuring Device and Its Method of Use. Filed Nov. 30, 1973. PC $4/MF $1.45.

Patent 3,821,100. Copper Ion Selective Sensor. Filed Feb. 23, 1973. Patented June 28, 1974. Not available NTIS.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 9, 1974

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds: Inorganic Compositions: Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock: Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-8-73
GENERAL ORGANIC CHEMISTRY, GROUP 120—R. F. BURNETT, Acting Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids, Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-18-73
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Fore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-14-73
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-11-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-17-73
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-10-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-9-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-3-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-1-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-18-73
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-4-73
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-21-73
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	1-4-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-14-73
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-27-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures: Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	3-22-74

Expiration of patents: The patents within the range of numbers indicated below expire during October 1974, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 2,811,722 to 2,814,801, inclusive
Plant Patents ..... Numbers 1,656 to 1,660, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED DECEMBER 3, 1974

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T929,001
STABILIZED ALPHA-ALUMINA MONOHYDRATE EXTRUDATES

William C. Ziegenhain, and Galen K. Madderra, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

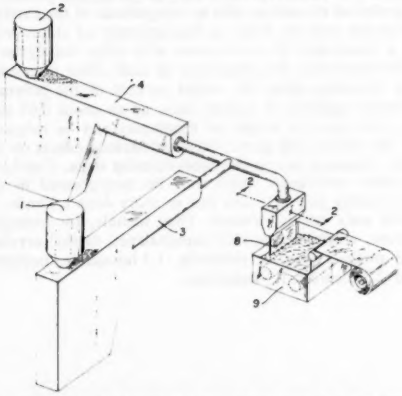
Filed May 31, 1973, Ser. No. 364,773
Int. Cl. C01f *7/02*
U.S. Cl. 423—625
No Drawing. 10 Pages Specification

In a method for producing alpha-alumina monohydrate extrudates by admixing acid, water, and alumina to form an extrudable composition, extruding the composition and drying to produce alumina extrudates, the improvement comprising gradually moistening the extrudates, thereby imparting water stability to the extrudates.

T929,002
PROCESS FOR PREPARING EXTRUDED CELLULOSIC FILM AND SHEETING HAVING EXCELLENT OPTICAL PROPERTIES

Max L. Carroll, Jr., 720 Teasel Drive, Apt. 14, Kingsport, Tenn. 37660

Filed July 16, 1973, Ser. No. 379,682
Int. Cl. B29f *3/10*
U.S. Cl. 260—224
1 Sheet Drawing. 5 Pages Specification



A process is disclosed for preparing extruded cellulosic film and sheeting having excellent clarity and other optical properties which are substantially free of die lines and similar die imperfections. The extruded cellulosic films and sheeting are extruded as a trilaminate with the center layer of the trilaminate being the cellulosic layer. The outer lamina which covers both sides of the cellulosic layer is of a dissimilar and incompatible thermoplastic material such as polyethylene. As the trilaminate flows through the die the outer thermoplastic layers prevent the inner cellulosic layer from contact with the lips of the die. After extrusion, the outer lamina can be stripped from the cellulosic center or inner lamina thereby providing an extruded cellulosic sheet or film free of die marks and which has excellent clarity.

T929,003
POWDER COATING COMPRISING A CELLULOSE ESTER AND A BLOCKED ISOCYANATE

Roy C. Foulk, 3630 Woodlark Lane 37660, and Richard L. Smith, 112 Meadow Lane 37663, both of Kingsport, Tenn.

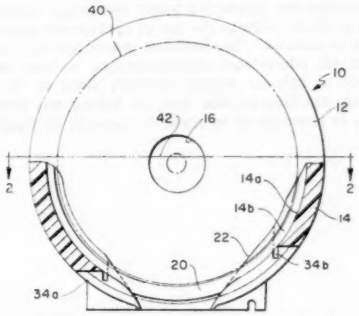
Continuation of abandoned application Ser. No. 290,662, Sept. 20, 1972. This application Sept. 4, 1973, Ser. No. 394,240
Int. Cl. C08b *21/06, 27/34, 27/52*
U.S. Cl. 106—169
No Drawing. 7 Pages Specification

Disclosed is a powder coating comprising an admixture of a blocked isocyanate and a cellulose ester which can be either cellulose acetate butyrate or cellulose acetate propionate. Plasticizers, stabilizers and pigments can optionally be added to the admixture. The powder coating can be applied to a heatable substrate and caused to fuse by application of heat to produce a smooth, strongly adherent, uncratered, thermally set coating.

T929,004
REEL ADAPTER FOR A CARTRIDGE

Clemens Hopfner, 3 Richard-Wagner-Str., 7304 Ruit, Germany, and Wolfgang Ort, 6 Daiberweg, 7 Stuttgart-Bad Cannstatt, Germany

Filed Oct. 10, 1973, Ser. No. 405,716
Int. Cl. G03b *1/04*
U.S. Cl. 242—71.1
1 Sheet Drawing. 6 Pages Specification



An adapter is provided for supporting a film reel in a film chamber of a cartridge. A preferred embodiment of the adapter includes a first portion adapted to be supported by the walls in the cartridge which define the film chamber and a second portion for cooperating with the circumferential edges of the reel flanges to maintain the film reel in the center of the film chamber and freely rotatably such that a film strip may be wound onto or may

be removed from the reel. If desired, the adapter can be made in different sizes so as to permit film reels of different capacities to be supported in a cartridge having a film chamber of a larger capacity. For example, the adapter could appropriately be used to support film reels which are designed to contain film lengths in a range between 200 and 400 feet in film cartridges which are dimensioned to support film reels containing film lengths of approximately 440 feet.

In the preferred embodiment disclosed, the adapter is of a generally arcuate shape and includes an opening between the first and second portions, the opening permitting a film strip to pass therethrough when the film strip is wound onto or removed from the film reel. If desired, the second portion of the adapter can be shaped so as to be partially received between the flanges of the film reel, thereby serving to restrain the film strip from being radially displaced from the reel when the reel is rotatably driven.

T929,005
POLYETHYLENE TEREPHTHALATE FILM MASKING MATERIAL
Conrad Erve Miller, Circleville, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation of abandoned application Ser. No. 333,523, Feb. 20, 1973. This application Nov. 19, 1973, Ser. No. 417,298
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 R
No Drawing. 13 Pages Specification

Biaxially oriented, heat-set, polyethylene terephthalate film from about 2.5 to 4.0 mils thick and containing from about 1.5 to 4 percent titanium dioxide, from about 1 to 2 percent silica and colored pigments selected from oarnge to red, such film having desired optical and surface properties rendering it suitable for use as a masking material.

T929,006
BAKING METHOD
Louis J. Lee, Rt. 13, 304 Montezuma Road., Kingsport, Tenn. 37664
Filed Feb. 19, 1974, Ser. No. 443,668
Int. Cl. A21d *2/16*
U.S. Cl. 426—24
No Drawing. 8 Pages Specification

A method for producing bread and other fermented dough products without the use of appreciable quantities of fats is disclosed. Succinylated monoglycerides, polysorbate 60, ethoxylated monoglycerides, sodium stearyl lactylate or calcium stearyl lactylate, alone or in combination, are incorporated into the baking mix prior to baking in amounts up to about 0.5 percent by weight of the flour. The process may be used in the continuous, brew-dough, sponge dough, or straight dough process and produces results similar to shortening and emulsifier in terms of volume, softness and texture.

T929,007
STRAIGHT DOUGH BAKING PROCESS
Ronald F. Czarnecki, 408 Oakmont Drive, Kingsport, Tenn. 37663
Filed Feb. 28, 1974, Ser. No. 446,871
Int. Cl. A21d *2/16*
U.S. Cl. 426—24
No Drawing. 8 Pages Specification

An improved straight dough process is disclosed for preparing yeast-leavened baked goods. Succinylated monoglycerides are used as an additive in the bake mix to improve such properties as machinability, loaf volume and grain score. Succinylated monoglycerides are added to the bake mix in amounts of from about 0.1% to about 0.5% by weight of the flour prior to baking.

T929,008
FAST-DRAINING NEOPRENE-ASBESTOS FIBER SLURRIES
Albertus van Cleeff, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 11, 1974, Ser. No. 449,722
Int. Cl. D21f *11/00*
U.S. Cl. 162—155
No Drawing. 7 Pages Specification

In the process of forming asbestos fiber sheets by depositing neoprene latex on chrysotile asbestos fibers in aqueous slurry, and draining water from the slurry through a screen, the rate of water drainage is increased by using a neoprene latex in which substantially all cations are potassium ions. The neoprene latex is prepared in the presence of potassium salts of anionic emulsifying agents and potassium salts such as potassium persulfate is preferred to sodium salts as components of the catalyst. Neoprene may be either a homopolymer of chloroprene or a copolymer of chloroprene with other copolymerizable monomers, the proportion of such other monomers not exceeding about 60 weight percent of the polymer.

Small amounts of sodium salts, up to about 0.05 part per 100 parts by weight of monomers can be tolerated by the system and do not have deleterious effects on the water drainage rate in the sheet-forming stage. Copolymerization monomers which may be incorporated in the chloroprene polymer have one or more double bonds, of which only one is terminal. They include, for example, styrene, vinyltoluenes, vinylnaphthalenes, methyl acrylate and methacrylate, acrylonitrile, 1,3-butadiene, isoprene, and 2,3-dichloro-1,3-butadiene.

REISSUE PATENTS

GRANTED DECEMBER 3, 1974

ERRATA

For CLASS	See PATENT NO.
043–043	28,262
074–010	28,261
267–057	28,259
096–010	28,360
424–263	28,258
324–001	28,264

REISSUES

DECEMBER 3, 1974

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,258

DIRECT POSITIVE SILVER HALIDE EMULSIONS CONTAINING HALOGENATED DERIVATIVES OF CYANINE DYES

Paul B. Gilman, Rochester, N.Y., Roberta A. Litzerman, Brighton, Mass, and Bernard D. Illingsworth, deceased, late of Rochester, N.Y., by Mary D. Clark, executrix, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original No. 3,501,309, dated Mar. 17, 1970, Ser. No. 609,734, Jan. 17, 1967, which is a continuation-in-part of abandoned application Ser. No. 533,458, Mar. 11, 1966. Application for reissue Mar. 16, 1972, Ser. No. 235,394

Int. Cl. G03c *1/36*

U.S. Cl. 96—101 **24 Claims**

21. A fogged direct positive silver halide emulsion containing, as electron acceptor, a cyanine dye derivative in which at least one terminal methine group of the parent cyanine dye is halogenated with chlorine, bromine or iodine.

28,259

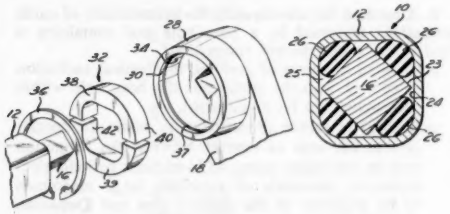
BEARING ASSEMBLY FOR ELASTIC JOINTS

Curtiss W. Henschen, % Henschen Industrial Corporation, Jackson Center, Ohio 44534

Original No. 3,436,069, dated Apr. 1, 1969, Ser. No. 622,666, Mar. 13, 1967. Application for reissue Sept. 13, 1973, Ser. No. 396,881

Int. Cl. B60g *11/18*

U.S. Cl. 267—57.1 **10 Claims**



1. In combination with an elastic joint comprising an outer tubular member, an inner member disposed generally concentrically within and spaced from the outer member for rotation relative thereto about a common axis, and means disposed within the outer member and interacting between it and the inner member to effect a yieldable restraint against relative rotation of the outer and inner members about said common axis; a bearing arrangement for positively maintaining the inner and outer members concentric with respect to said common axis of relative rotation and including housing means rigidly secured to said inner member for rotation therewith relative to said outer member and, together with said outer member, defining a bearing race about said outer member, and a bearing element disposed within said bearing race to maintain the inner and outer members concentric with respect to said axis.

28,260

ELECTROPHORETIC IMAGING PROCESS INCLUDING APPLICATION OF DYNAMIC STRESS ON THE PARTICLE SUSPENSION

Edwin Zucker, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Original No. 3,616,391, dated Oct. 26, 1971, Ser. No. 764,720, Oct. 3, 1968. Application for reissue Sept. 27, 1973, Ser. No. 401,331

Int. Cl. B01k *51/00;* **G03g** *13/22*

U.S. Cl. 96—1.3 **3 Claims**

1. In a method for imaging electrophoretic particle suspensions having a first electrode adapted to support the suspension, a second electrode capable of being brought into rolling contact with the suspension such that the suspension is maintained between said electrodes, including applying an electric field across the suspension between the electrodes, and exposing the suspension to an image with activating electromagnetic radiation, the improvement including bringing the second electrode into contact with the suspension and moving one of said electrodes relative to the other at a predetermined traversing velocity, superimposing overriding forces on one of said electrodes to impart a surface speed thereon slightly different from its predetermined traversing velocity thereby imparting forces on the particles within the suspension that are less than those necessary to destroy the image formed on the first electrode and sufficient to dislodge a portion of the nonimage forming particles in the suspension, such forces being unrelated to the electrical forces between the electrodes.

28,261

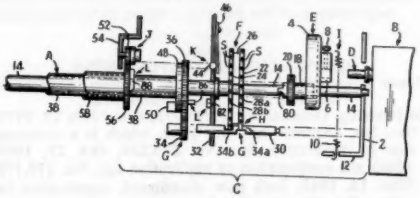
INDEXED TV TUNER

Carroll R. Miner, Wilbraham, Mass., assignor to General Instrument Corporation, Newark, N.J.

Original No. 3,788,152, dated Jan. 29, 1974, Ser. No. 272,369, July 17, 1972. Application for reissue May 6, 1974, Ser. No. 467,118

Int. Cl. F16h *27/04, 35/18*

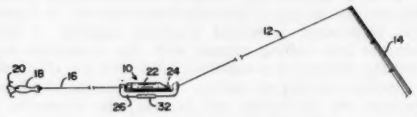
U.S. Cl. 74—10.5 **46 Claims**



1. A tuning assembly comprising an input member, an output member, a tuning element operatively connected to said output member to be positioned thereby, and transmission means operatively connected between said members and comprising index means operatively connected to said output member for movement therewith, a plurality of stop surfaces respectively corresponding to operative and positions for said tuning element, actuator means operatively connected to said input member and movable thereby to positions engaged by succes-

sive stop surfaces, biasing means operatively connected to said index means for urging said index means in a direction to cause said top surfaces to engage said actuator means, and driving means operatively connected between said input member and said index means for moving the latter to bring successive stop surfaces into engagement with said actuator means.

28,262
DEPTH CONTROL DEVICE
Norman H. Nye, Cuyahoga Falls, Ohio
(1056 Home Ave., Akron, Ohio 44310)
Original No. 3,727,341, dated Apr. 17, 1973, Ser. No. 218,713, Jan. 18, 1972. Application for reissue June 21, 1973, Ser. No. 372,334
Int. Cl. A01k *85/00*
U.S. Cl. 43—43.13 **17 Claims**



1. A device adapted to be connected to a fishing line for positioning a lure at a preselected temperature zone in a body of water, comprising:

an elongated member, [one end of which is slanted relative to the longitudinal axis of the member;]

a keel plate having a center portion extending parallel to the longitudinal axis of the member and closely adjacent the outer surface of the member and end portions projecting upwardly from opposite ends of the center portion, the fishing line being connected to [the] *one* end portion [adjacent to the slanted end] of the [cylindrical member] *keel plate* and the lure being connected to the other end portion;

means connecting the member to the end portions of the keel plate, the means permitting rotation of the member about its longitudinal axis;

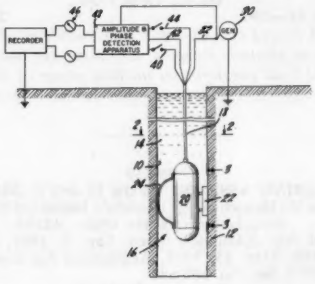
[at least one fin projecting outwardly from and angled relative to the longitudinal axis of the member;] *means operatively carried by said member and including a portion slanted with relation to the longitudinal axis of said member and a device to urge rotation of said member with relation to said keel plate;* and

temperature responsive latching means operative to prevent rotation of the member relative to the keel plate.

28,263
DISINFECTING COMPOSITIONS
Claude Gauvreau, Ottawa, Ontario, Canada, assignor to Holliston Labs., Inc., Boston, Mass.
No Drawing. Original No. 3,595,975, dated July 27, 1971, Ser. No. 854,009, July 29, 1969, which is a continuation of application Ser. No. 500,225, Oct. 21, 1965, which is a continuation of application Ser. No. 179,778, Mar. 14, 1962, both now abandoned. Application for reissue July 27, 1973, Ser. No. 383,187
Int. Cl. A61k *27/00*
U.S. Cl. 424—263 **23 Claims**

1. A composition of matter possessing synergised growth-inhibiting properties against bacteria and fungi consisting essentially of as active ingredients a halide salt of cetyl pyridinium and a monoterpene selected from the group consisting of citronellal, citronellol, eucalyptol, fenchone, geraniol, linalool, menthol, nerol, p-cymene, pinene, pulegone, terpineol, thymol and citral, the weights of said active ingredients having a ratio of between about 1:50 and 50:1.

28,264
APPARATUS FOR WELL LOGGING BY MEASURING AND COMPARING POTENTIALS CAUSED BY SONIC EXCITATION
Adelbert Semmelink, St. James, Cape, South Africa, assignor to Schlumberger Technology Corporation, Houston, Tex.
Original No. 3,599,085, dated Aug. 10, 1971, Ser. No. 832,679, June 12, 1969. Application for reissue Aug. 7, 1973, Ser. No. 386,449
Int. Cl. G01v *3/18*
U.S. Cl. 324—1 **11 Claims**



1. A method for investigating the permeability of earth formations traversed by a bore hole and containing a fluid in the pores thereof comprising:

positioning a source of periodic mechanical excitation in contact with the surface of the bore hole within a formation to be investigated,

actuating the source to periodically excite the formation at the area of contact between the formation and the excitation source so as to cause periodic electrokinetic potentials of relatively large magnitude to be produced at the contact area and [separate, periodic electrokinetic potentials] of proportionally smaller magnitude to be produced at locations spaced from the contact area,

simultaneously with excitation of the formation measuring the magnitude of the relatively large electrokinetic potentials [at] *near* the contact area and the magnitude of the proportionally smaller electrokinetic potentials at at least one other location spaced from the contact by a distance large relative to the electrokinetic skin depth of the formation, and

determining the ratio of the magnitude of the electrokinetic potentials at each other location to the magnitude of the electrokinetic potentials [at] *near* the contact area, said ratio being an indication of the permeability of the formation.

PATENTS

GRANTED DECEMBER 3, 1974

ERRATA

For CLASS	See PATENT NO.
057–075	3,851,448
057–091	3,851,698
242–055	3,851,760
226–091	3,851,816
238–230	3,851,821
292–111	3,851,922
209–166	3,852,167
209–469	3,852,168
208–058	3,852,207
261–069	3,852,391
260–873	3,852,393
260–873	3,852,394
260–953	3,852,395
260–957	3,852,396
260–968	3,852,397
424–001	3,852,413
424–001	3,852,414
424–001	3,852,415
424–014	3,852,416
424–047	3,852,417
424–075	3,852,418
424–084	3,852,419
424–092	3,852,420
424–094	3,852,421
424–100	3,852,422
424–115	3,852,423
424–118	3,852,424
424–120	3,852,425
358–009	3,852,520
250–385	3,852,610
250–445	3,852,611
250–492	3,852,612

PATENTS

GRANTED DECEMBER 3, 1974

GENERAL AND MECHANICAL

3,851,336

BIB

Jonna Hjerl, Dyndsager 8 A, DK-2750 Ballerup, Denmark

Filed May 22, 1973, Ser. No. 362,725

Claims priority, application Denmark, May 26, 1972, 2630/72

Int. Cl. A41b *13/10*

U.S. Cl. 2—49 R **2 Claims**

1. A bib with a pocket comprising a rectangular blank of soft weldable sheet material having a neckline cutout at one end and reinforcing ribs fixed to and extending along the longitudinal edges of the rectangle, the two halves of the edge opposite the cutout being joined to each other.

3,851,337

UNIVERSALLY MOVABLE ANKLE JOINT FOR TUBE SKELETON ARTIFICIAL LIMBS

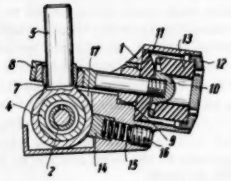
Klaus Prahl, Luneburg, Germany, assignor to IPOS Gesellschaft fur integrierte Prothesen-Entwicklung und orthopadietechnischen Service m.b.H & Co., KG, Luneberg, Germany

Filed July 20, 1973, Ser. No. 381,226

Claims priority, application Germany, Aug. 1, 1972, 2237758

Int. Cl. 3 *28;* **A61f** *1/04, 1/08*

U.S. Cl. 3—32 **3 Claims**



1. Universally movable ankle joint for tube skeleton artificial limbs comprising a support element, an axle screwed into engagement with said support element, said axle having a first axis, a first joint bearing fixed on said axle within said support element and extending around the first axis thereof, a first eye bolt press fitted about the outer periphery of said joint bearing and said first eye bolt extending outwardly from said axle with the axis of the outwardly extending portion thereof extending transversely of the first axis of said axle, a second joint bearing press fitted onto said eye bolt at a position spaced outwardly from said axle and extending around the axis of the outwardly extending portion of said first eye bolt, a second eye bolt pressed onto the outer periphery of said second joint bearing and said second eye bolt having a shank extending from said second joint bearing with the axis of said shank extending transversely of the axis of said first eye bolt, a third bearing extending around the shank of said second eye bolt at a position spaced along said shank outwardly from said first eye bolt, said third bearing supported in said support element, a closure plate fitted on the end of said shank spaced more remotely from said first eye bolt and located within said support element, a first resilient buffer element positioned in said support element encircling said shank and positioned between and in contact with said third bearing and said closure plate, and a second resilient buffer element mounted in said support element and disposed in contact with the opposite surface of said closure plate from said first buffer element, and said closure plate controlling movement limitation.

3,851,338

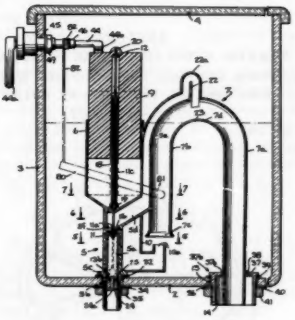
FLUSHING DEVICE

Vernon D. Roosa, 184 Wood Pond Rd., West Hartford, Conn. 06107

Continuation of Ser. No. 200,343, Nov. 19, 1971, , which is a division of Ser. No. 53,170, July 18, 1970,. This application June 20, 1973, Ser. No. 371,896

Int. Cl. E03d *1/36*

U.S. Cl. 4—41 **6 Claims**

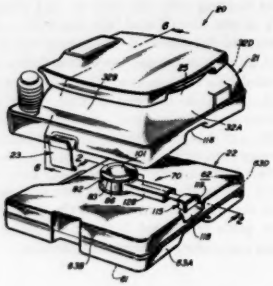


1. In a flushing device for toilets, in combination, an inlet conduit for filling a reservoir with water, a valve for controlling the flow of water through the inlet, a float connected to the inlet valve for operating the inlet valve, means for actuating said float, a siphon adapted to be connected to the outlet of the reservoir for flushing a toilet, a conduit having one end connected to the siphon and its other end operatively connected to a conduit-adjusting means to admit air to the siphon to stop the flushing when said other end of said conduit is above a predetermined water level and means for operating said conduit-adjusting means to raise and lower the said other end of the conduit to change the water level at which the flushing stops.

3,851,339
PORTABLE, SELF-CONTAINED TOILET

Vaughn D. Flinner, Prairie; Richard W. Sprang, Lakeville; Dana D. Zody, and Howard A. Fulton, both of Perrysville, all of Ohio, assignors to Mansfield Sanitary Inc., Perrysville, Ohio

Filed Oct. 23, 1973, Ser. No. 408,664
Int. Cl. A47k *11/02*; E03d *5/016*; A61l *11/00*
U.S. Cl. 4—115 13 Claims

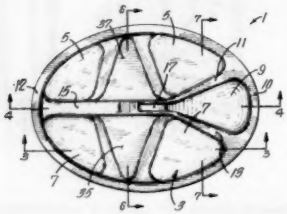


1. A portable toilet comprising; a seat section and a holding tank section, said holding tank section having an inlet port, a flush valve housing, means to fasten said flush valve housing to said inlet port, a thimble formed on said valve housing and extending oppositely of said holding tank section, a passageway extending through said valve housing and thimble, a valve element comprising a portion of a sphere mounted for rotation within said thimble, means to rotate said valve element selectively to open and close said passageway, said seat section having a bowl portion that converges downwardly to a drain, a socket circumscribing said drain, the thimble presented from said valve housing being insertably receivable within said socket and means to effect a seal between said thimble and said socket.

3,851,340
PLASTIC CONTAINER FOR FOOTBATH

Andreas Keusch, 440 Place Vimy, Brossard, Quebec, Canada

Filed Sept. 28, 1973, Ser. No. 401,866
Int. Cl. A47k *3/022*
U.S. Cl. 4—182 1 Claim

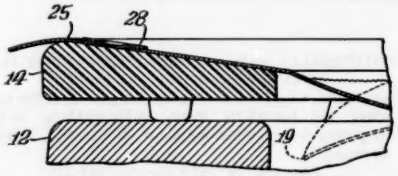


1. A molded plastic footbath container comprising:
a molded body portion;
an interior cavity formed in said molded body portion and surrounded by an external wall;
a first wall means in said cavity enclosing a first portion of said cavity, said first portion comprising a fluid mixing chamber;
second wall means in said cavity extending from said first wall means to said external wall separating a second portion of said cavity from a third portion of said cavity, said second and third portions being separated from said first portion by said first wall means, said second and third portions comprising feet receptacles;
a groove extending from the mixing chamber along a portion of said second wall means;
the floor of said groove diverging upwardly in a direction away from said mixing chamber and merging with the top surface of said second wall at the end of the groove remote from said mixing chamber;
the portion of the top surface of said second wall means between said first wall means and said external wall being above the top surfaces of said second and third cavity portions;
the top surface of said second wall being below the top surface of said external wall;
said groove forming channel means in said second wall means, said channel means being in fluid communication, at one end thereof, with said first portion and, at another end thereof, with said second and third portions;
whereby fluid will communicate between said first portion and said second and third portions when said container is tilted about the end of the container opposite said mixing chamber.

3,851,341
SANITARY TOILET SEAT COVER

Haruko Aoyama, 539 Stratford Pl., Apt. 201, Chicago, Ill. 60657

Filed Nov. 19, 1973, Ser. No. 416,995
Int. Cl. A47k *13/14*, *13/16*
U.S. Cl. 4—243 2 Claims



1. A sanitary toilet seat cover comprising, a single sheet of paper or the like cut to form an outer annular portion of a size and shape to overlie a toilet seat, said sheet having an inner central portion detachably secured at one end to an inner edge of the annulus, said sheet being folded to provide at least a center fold extending from the front portion of the annulus to the rear portion thereof, an opening in said front portion or annulus bisected by said center fold, said opening having a diameter of from one-eighth to one-fourth inch, and an adhesive-bearing patch adhesively secured to the upper surface of said front portion and covering the opening whereby pressure on said patch will cause the adhesive exposed through said opening to adhere to the front portion of the toilet to secure the seat cover in place.

3,851,342
HYDRAULIC PULSE, SCALE-BLOCKED-PIPE CLEANER

Charles A. Moore, 112 W. 193rd St., Mokena, Ill. 60448

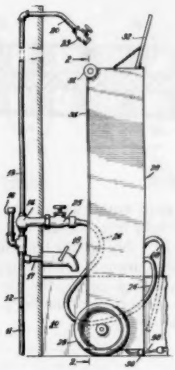
Filed May 18, 1973, Ser. No. 361,574
Int. Cl. E03d *11/00*; B08b *9/02*
U.S. Cl. 4—256 19 Claims

1. In an apparatus for cleaning scale from the inside of a water pipe having water therein, said apparatus comprising an impulse generator for producing periodic positive and negative water pulses, means for connecting the impulse generator to the pipe for free communication between the impulse generator and the water in said pipe so that the water in the pipe is pulsed positively and negatively whereby the pipe is cleaned

by said pulses in conjunction with the abrasive action of the loosened scale in said pipe, the improvement wherein said generator comprises:

a closed vessel defining a chamber in communication with said pipe;

expansile means within said chamber for changing the volume of water within the chamber as said means expands and contracts, said expansile means defining an enclosed



interior space having fluid therein, the exterior of the expansile means being in contact with the water in said chamber, means communicating with the interior space of the expansile means and the exterior of said chamber for permitting the fluid to flow in and out of said expansile means as the expansile means expands and contracts; and power means connected to said expansile means to periodically expand and contract said expansile means.

3,851,343

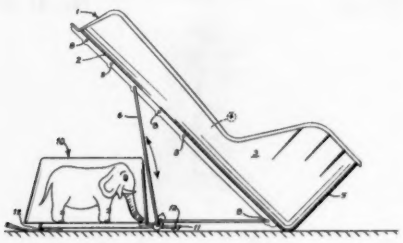
INFANT SEAT ROCKER

William G. Kinslow, Jr., 2 N.W. 69th, Kansas City, Mo. 64118

Filed Aug. 9, 1973, Ser. No. 387,080

Int. Cl. A47d *9/04*

U.S. Cl. 5—109 **2 Claims**



1. A rocker for a separate conventional infant seat, said infant seat having an elongated floor with side walls and an end wall upstanding from the floor to support the infant and having a framework beneath the floor operable to support the infant seat with the seat floor inclined upwardly away from a horizontal plane;

said rocker comprising an elongated main platform;

a motor mounted on the main platform having a shaft extending transversely of and above the platform;

a hollow cover over the motor having a top wall, side walls and end walls forming together an enclosure over the platform and surrounding the motor;

pivot means within the enclosure adjacent to one end wall pivotally mounting the cover on the platform;

lifting means beneath the cover operable to lift the cover up and down about said pivot means; and

means operably connecting the lifting means to the motor shaft;

and an infant seat supported on the end of the cover most remote from the pivot means operable to receive and support the framework to transmit the pivotal up and down movement of the cover to the infant seat to rock an infant residing in the infant seat, said infant seat support comprises an upwardly opening transverse hook for openly receiving and supporting the infant seat framework therein.

3,851,344

FOLDING BED ASSEMBLY

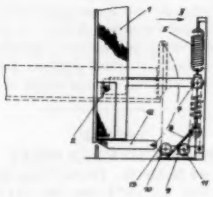
Erna Zeithammer, Neustiftgasse 106, Vienna, Austria

Filed Mar. 16, 1973, Ser. No. 342,057

Claims priority, application Austria, Mar. 24, 1972, 2549/72

Int. Cl. A47b *83/00*

U.S. Cl. 5—164 D **3 Claims**



1. A folding bed assembly, which comprises

a boxlike covering which has a bottom and a vertical rear wall and is open in front opposite to said rear wall,

a bed having two ends,

means defining a horizontal pivot adjacent to one of said ends, said bed being movable about said pivot from a horizontal position to a position in said covering, and

torque-balancing means arranged to facilitate the movement of said bed about said pivot and comprising a deflecting pulley disposed adjacent to said bottom and in front of said rear wall and spaced from the latter, a tension rope connected to said bed and trained around said pulley, and a spring loading said tension rope.

3,851,345

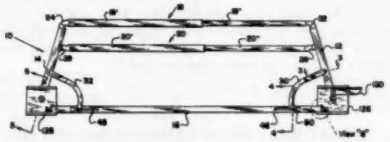
SAFETY SIDE MECHANISM

Roland A. Benoit, and Edmond P. Guillot, both of Danielson, Conn., assignors to Interroyal Corporation, New York, N.Y.

Filed May 17, 1972, Ser. No. 254,167

Int. Cl. A47c *21/00*

U.S. Cl. 5—331 **6 Claims**



1. For hospital beds, a safety side mechanism comprising:

a base member;

at least one telescoping side rail member substantially parallel to said base member;

a pair of side members pivotally attached to said base and said rail member; said base, said side rail and said side members forming a trapezoid;

said side members being biased toward an extended position with respect to said base member;

a pair of push arm members connected between respective side members and said base member and biasing means connected between the lower ends of said push arm members for urging said trapezoid into said extended position; said base member including slots in which said lower ends of said push arm members reciprocally move as said safety side mechanism is moved from the extended to the collapsed positions;

said biasing means comprising a pair of parallel spaced apart overlapping puss-pull bars, a connecting means connecting adjacent ends of said push-pull bars for permitting equal and opposite movement between said push-pull bars and a spring means connecting the intermediate portions of said push-pull bars for permitting equal and opposite movement between said push-pull bars and a spring means connecting the intermediate portions of said push-pull bars tending to urge said push-pull bars toward each other so that said safety side mechanism isurged toward the extended position; and

pivotal attachment means for pivotally attaching said mechanism to a frame member of said hospital bed adapted to be pivoted alongside said frame member when said trapezoid is in a collapsed position defined by said side, rail and base members being substantially parallel so that said mechanism in said collapsed position does not substantially extend beyond the normal width of said bed.

3,851,346

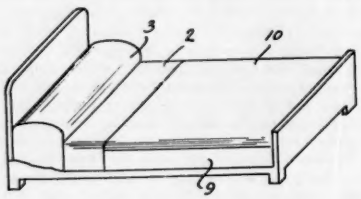
PROTECTIVE BED SHEET

A. Ray Fillmore, 64 Robie St., Truro, Nova Scotia, Canada

Filed Feb. 12, 1973, Ser. No. 331,351

Int. Cl. A47g *9/00*

U.S. Cl. 5—334 R **4 Claims**



1. A bed sheet comprising a main portion, and a first foldable flap and a second foldable flap at one edge of said main portion, said first and second flaps being coextensive with the dimension of the edge of said main portion, said first flap being capable of being folded back over and being fastened to said main portion to provide a pocket, said second flap being capable of forming an extension to said main portion of a length to form a cover for a pillow and also being capable of being folded back over said first flap, said first flap and said main portion being provided with means for removably fastening said first flap to said main portion at lateral edge portions of said first flap and said main portion.

3,851,347

HEART BEAT NOISE ELIMINATING PILLOW

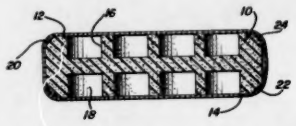
Burnis C. Ashley, P.O. Box 188, Eddy, Tex. 76524

Filed Nov. 12, 1973, Ser. No. 414,761

Int. Cl. A47g *9/00*; **A47c** *27/00*

U.S. Cl. 5—338 **1 Claim**

1. A noise absorbing pillow construction comprising a thick panel-like body having upper and lower surfaces, said body being constructed of soft, shape-retentive and resilient cellular material, the upper and lower surfaces of said body including longitudinally and transversely spaced outwardly opening blind recesses formed therein of substantially the same width, said recesses each having a minimum width of more than one inch and a maximum width of less than three inches, said recesses being substantially two inches in width and disposed



on centers spaced apart both transversely and longitudinally of said body substantially three inches, said recesses extending approximately one third through the thickness of the body and the recesses opening outwardly of the upper surface of the body being vertically registered with the recesses opening outwardly of the lower surface of the body, and a cloth cover loosely enclosing said body.

3,851,348

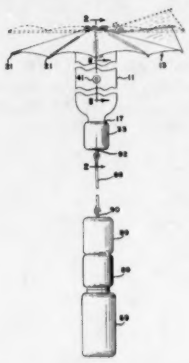
ANGULAR RISE FLOTATION GEAR

William A. Gilbert, 6511 Knollbrook Dr., Hyattsville, Md. 20783, and Leon E. Wedding, 4690 Leslie Ave., Washington, D.C.

Filed Jan. 12, 1953, Ser. No. 330,929

Int. Cl. B63b *21/52*

U.S. Cl. 9—8 R **8 Claims**



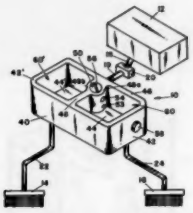
1. A parachute for use with a submerged buoyant system comprising a center plate adapted to be secured to the submerged buoyant system, a first and a second foldable semicircular piece each having a plurality of radial rods pivotally connected to said center plate, lock means on said center plate engageable with the rods on said first piece to lock said first piece in a horizontal position after an initial increase in depth of the submerged buoyant system from a predetermined depth opens it, and said second piece having means enabling it to open to a horizontal folded position or to a downwardly folded position whenever the submerged buoyant system deviates from said predetermined depth.

3,851,349

FLOOR SCRUBBER FLOW DIVIDER

Dale E. Lowder, Muskegon, Mich., assignor to Clarke-Gravely Corporation, Muskegan, Mich.

Filed Sept. 26, 1973, Ser. No. 400,955
Int. Cl. A47l *11/03*
U.S. Cl. 15—50 R 10 Claims



1. In a surface treating device having at least a pair of surface treating elements, and a supply source of liquid for distribution to said surface treating elements, apparatus for distributing liquid from the supply source into at least said pair of associated surface treating elements, said distribution apparatus comprising:

a housing having an inlet chamber adapted for connection to said source to receive fluid therefrom;

a pair of fluid outlet chambers in said housing, each of said outlet chambers adapted to receive a portion of the liquid from said inlet chamber and direct the same to one of said surface treating elements; and

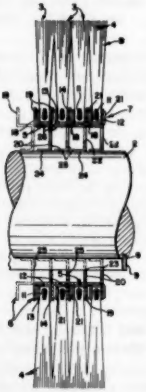
flow control means between said inlet chamber and each of said outlet chambers, said flow control means including a set of a plurality of outlet passageways formed between said inlet chamber and each of said outlet chambers, said passageways being of graduated proportion to permit an increase of fluid flow from said inlet chamber to each of said outlet chambers as the fluid flow in said inlet chamber increases.

3,851,350

INTERLOCKING ROTARY BRUSH CONSTRUCTION

Arthur T. Schofield, Brecksville, Ohio, assignor to The Manufacturers Brush Company, Cleveland, Ohio

Filed Aug. 6, 1973, Ser. No. 385,985
Int. Cl. A46b *13/00*
U.S. Cl. 15—181 16 Claims



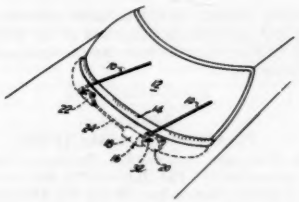
1. In a rotary brush assembly, an annular sheet metal hub member (6) comprising an annular channel (20) and an integral radial flange (19) with a large number of circumferentially spaced tab-receiving slots (18) therein located adjacent the outer tubular portion (26) of said channel, said channel having an inner shaft-engaging sleeve portion (24) and a radial wall portion (25) cut to provide a large number of vertically elongated slots (22) and integral elongated tabs (21) bent outwardly from said slots at the outer edges of said slots, each tab (21) being generally in axial alignment with one of said tab-receiving slots (18) and having a width less than the length of that slot, whereby the tabs of said hub member (6) will fit the tab-receiving slots of an identical hub member to provide means for interlocking said members.

3,851,351

WINDSHIELD WIPER DRIVE

Joseph Pickles, Birmingham, and Albert Duckworth, Dearborn Heights, both of Mich., assignors to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Feb. 5, 1973, Ser. No. 329,678
Int. Cl. B60s *1/20*
U.S. Cl. 15—250.25 5 Claims



1. A windshield wiper system for an automobile having a transversely curved windshield, comprising an elongated upwardly open well forward of the windshield and curved laterally in conformity with the transverse curvature of the windshield, a motor and master drive unit assembly mounted in said well toward one end from the center thereof and accessible for repair or removal through the open top of said well, the master drive unit of said assembly having a wiper arm drive shaft extending generally perpendicular to the portion of the curved windshield thereabove, a slave drive unit mounted in said well toward the other end from the center thereof and accessible for repair or removal through the open top of said well, said slave drive unit having a wiper arm drive shaft extending generally perpendicular to the portion of said curved windshield thereabove and extending at an oblique angle to the drive shaft of said master drive unit, motion transmission means interconnecting said drive shafts, said motion transmission means comprising a push-pull flexible device curved longitudinally to conform to the lateral curvature of said well, and to accommodate the oblique angularity between said drive shafts.

3,851,352

CYLINDER CONTAINING MANUALLY OPERABLE PISTON FOR CLEANING SPRAY NOZZLE PASSAGES WITH AIR BLAST

Barry Reginald Hibberd, 8 Eden Chase, Common Rd., Langley Slough, and David Talbot Standing, 30 Carlton Rd., Walton-on-Thames both of England

Filed June 4, 1973, Ser. No. 366,355
Claims priority, application Great Britain, Feb. 8, 1973, 6233/73
Int. Cl. B08b *5/02*, *9/00*
U.S. Cl. 15—341 5 Claims

1. A device for clearance of a nozzle used for spraying and like purposes, comprising means forming a tubular passage

with manually operable piston means for forcing a blast of air therethrough, said passage having means at its air-outlet end to form a seating for freely and removably accommodating the

nozzle being cleared, and detachable retainer means for clamping the nozzle to the outlet end of the tubular passage while the air blast escaping from the passages passes through the nozzle to clear it.

3,851,353

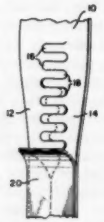
PLIABLE TAPE STRUCTURES

Alfred W. Wakeman, Madison Rd., Durham, Conn. 06422

Division of Ser. No. 159,796, July 6, 1971, Pat. No. 3,751,760, which is a continuation-in-part of Ser. No. 859,619, Sept. 22, 1969, abandoned. This application July 16, 1973, Ser. No. 379,265

Int. Cl. E05d *7/00*

U.S. Cl. 16—150 **7 Claims**



1. A flexible tape for joining mating edges of adjacent members, said tape having an X-like configuration in cross-section and providing a longitudinally continuous structure adapted to extend along and be secured to the edges of members to be joined so that the axis of said X-like configuration coincides generally with the juncture formed by the members to be joined, said tape comprising

confronting strips of sheet material having longitudinally continuous, freely separable marginal portions,

at least two of said marginal portions having integrally formed bridging tabs spaced longitudinally along and extending transversely of said marginal portions in opposing relation, the tabs of each of said portions being intermeshed and secured to an opposite strip in alternating relation along the longitudinal axis of the resulting structure.

3,851,354

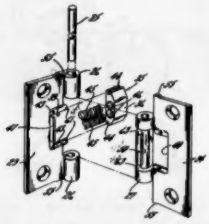
SELF-CLOSING BUTT HINGE

Lloyd L. Anderson, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Oct. 11, 1972, Ser. No. 296,661

Int. Cl. E05d *11/10*

U.S. Cl. 16—180 **3 Claims**



1. A butt hinge comprising a hinge pin, first and second substantially flat mounting wings each having an ear received on said pin, said first wing being swingable about the axis of said pin and relative to said second wing from a predetermined position in which said wings are disposed in face-to-face relationship to another position in which the wings are disposed out of face-to-face relationship, a pressure member mounted on one of said wings and located in the gap between the opposing faces of said wings when said first wing is in said predetermined position, a spring mounted on said one wing and urging said pressure member edgewise of said one wing and toward said pin to bias said first wing to said predetermined position, and an opening formed in the other one of said wings and located to receive at least part of said pressure member when said first wing is in said predetermined position whereby said wings are positioned closely together when disposed in face-to-face relationship.

3,851,355

CONTINUOUS MEAT FORMING APPARATUS

Alvin W. Hughes, Bensenville, Ill., assignor to A. W. Hughes Company, Inc., Addison, Ill.

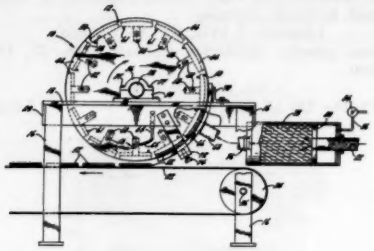
Filed Feb. 28, 1973, Ser. No. 336,637

Int. Cl. A22c *7/00*

U.S. Cl. 17—32 **4 Claims**

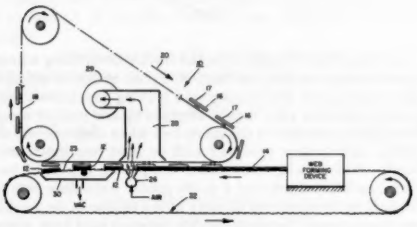
1. In a meat forming apparatus having a rotatable wheel carried by a central shaft and mounted on an upright framework, said wheel having a plurality of cavities disposed radially about its peripheral surface, piston means disposed in each of said cavities, an arcuate guide having an inlet conduit therein positioned adjacent the peripheral surface of said wheel, a continuous source of meat product connected to said guide inlet for supplying the meat product thereto and means for rotating the wheel, the improvement comprising, the wheel cavities each being generally T-shaped in cross section including an enlarged pocket portion adjacent the peripheral surface of the wheel and a radially extending bore, means defining at least one transverse elongated opening passing through the wheel and intercepting each said bore, said pistons each being correspondingly, generally T-shaped in cross section including an enlarged head and a tubular shank, said shank having a threaded opening therein positioned adjacent to said transverse elongated opening, an arm member having a threaded end disposed in said elongated opening and threadably attached to the piston shank, said arm projecting axially, outwardly from said wheel, means including a trip arm carried by the framework adjacent one side of the wheel and having a

cam surface thereon adapted to be engaged by said outwardly projecting arms when the wheel rotates thereby urging the



pistons connected to said arms radially outward to eject a molded meat product from said mold cavities.

3,851,356
METHOD OF FORMING FIBROUS PADS
Peter P. Savich, Longmeadow, Mass., assignor to Scott Paper Company, Delaware County, Pa.
Filed Mar. 5, 1973, Ser. No. 337,932
Int. Cl. A61l *15/00*
U.S. Cl. 19—144.5 **4 Claims**



1. A method for forming at least one discrete fibrous pad having a predetermined shape from an air-laid fibrous web, said method comprising the steps of:

A. confining said fibrous web between a support member and at least one discrete surface to leave sections of said web unconfined, each discrete surface having a shape of a discrete fibrous pad to be formed; and

B. subjecting the unconfined sections of said web to a stream of gas for removing said unconfined sections from said web to form discrete fibrous pads having substantially the same shape as each discrete surface.

3,851,357
FASTENER
William A. Ribich, Lexington, and David B. Russell, Ashland, both of Mass., assignors to American Velcro Inc., New York, N.Y.
Filed Feb. 3, 1971, Ser. No. 112,353
Int. Cl. A44b *17/00*
U.S. Cl. 24—73 P **24 Claims**

1. A fastening device adapted to be securely attached to a mounting plate, said fastening device comprising:

a. a fastening member including:

1. a flexible base element; and

2. a multiplicity of flexible resilient hooking elements projecting from one surface of the base element and adapted to be secured to a surface having complementary hooking elements by pressing opposed hooking elements and complementary hooking elements together in face-to-face relation; and

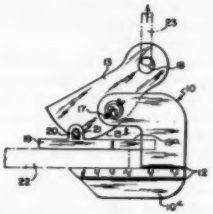
b. at least one snap fastening member securely affixed to said fastening member and including:

1. a flexible base member joined integrally to the other surface of said base element; and

2. holding means including (i) at least two spaced retaining members; and (ii) support means for supporting said retaining members on said base member for resilient relative movement toward and away from each other upon flexing of at least a portion of said flexible base member out of its normal plane, said retaining members being adapted for snapping into locking en-

gagement in an opening in the mounting plate to secure the snap fastener member in contiguous relation with the mounting plate, said holding means characterized by the property that applying peeling forces to separate the hooking elements from the complementary hooking elements will flex at least a portion of the base member and the fastening member out of their normal planes and increase the separation between the retaining members to thereby increase the gripping action of the holding means in said opening and further resist separation of the fastening member from the mounting plate to retain said base member in contiguous relation with the mounting plate.

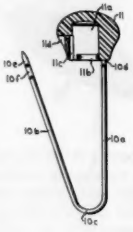
3,851,358
NON-MARRING HORIZONTAL CLAMP
Michael J. Janosko, 2421 Bridge Ave., Cleveland, Ohio 44113
Filed Oct. 1, 1973, Ser. No. 402,406
Int. Cl. B66c *1/48;* **A44b** *21/00*
U.S. Cl. 24—248 C **12 Claims**



1. A non-marring clamp for lifting flat workpieces such as steel plates in a horizontal position, comprising a base including an upwardly facing flat clamping surface, means fixed to one side of said surface and extending upwardly and there providing an inwardly extending projection over said surface for supporting an oscillatatable clamping lever, a clamping lever having a pivot connection intermediate its ends to the forward end of said projection, said clamping lever having a clamping cam below the level of said pivot connection eccentric relative to said pivot connection and of which the eccentricity increases in a forward direction, a clamping plate having a pin and slot connection with the lower portion of said clamping lever near said eccentric clamping cam holding said clamping plate loosely and generally parallel to said flat clamping surface, said clamping plate and said clamping surface having smooth flat faces presented toward a workpiece to

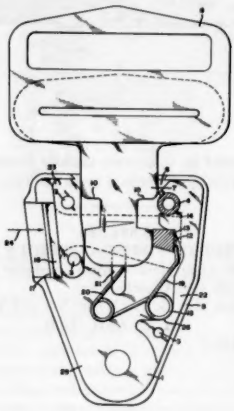
be lifted, and means for attaching a lifting device to the upper portion of said clamping lever.

3,851,359
DISPOSABLE SAFETY PIN
Leroy Wilson, P.O. Box 203, Manhattan, Kans. 66502
Filed May 2, 1973, Ser. No. 356,371
Int. Cl. A44b 9/18
U.S. Cl. 24—156 R 1 Claim



1. A disposable safety pin which, having once been fastened, cannot be reopened, said safety pin comprising:
an arcuately bowed shank having first and second leg portions integrally connected at the lower ends thereof by a resiliently flexible portion;
a first frangible portion integrally joined to the upper end of said first leg portion and having a larger dimension lying in the plane of said shank and having a reduced dimension substantially normal to the plane of said shank to provide a first weakened line of severance within the plane of said shank;
a second frangible portion integrally joined to the upper end of said second leg portion and having a larger dimension lying in the plane of said shank and having a reduced dimension substantially normal to the plane of said shank to provide a second weakened line of severance within the plane of said shank;
a fabric piercing point portion integrally joined to said second frangible portion and having a greater dimension from which said portion tapers to a sharp point;
a safety pin head element integrally connected to said first frangible portion; and
capture means associated with said head for permanently retaining the point of said shank when the safety pin has been fastened, said capture means including:
an interior chamber within said head and of sufficient dimensions to receive said point portion;
an elongate opening disposed in the bottom of said head and adjoining said interior chamber, said opening being slightly greater in width than said reduced dimension of said second frangible portion and being smaller in width than said greater dimension of said point portion and thereby adapted to receive said second frangible portion for reciprocal movement therein; and
a resiliently flexible closure member associated with said head and communicating with said interior chamber to admit said point portion to said chamber and said second frangible portion to said opening, but to prevent removal of said point portion from said chamber;
whereby, once the safety pin is fastened with the point portion captured within said interior chamber, removal of the safety pin may be accomplished by fracture of the first and second frangible portions in order to separate said head element from said shank.

3,851,360
BUCKLE FOR SAFETY BELTS
Horst Minolla, Heidestieg, Germany, assignor to Klippan GmbH, Kohfurth, Germany
Filed Feb. 2, 1972, Ser. No. 222,858
Claims priority, application Germany, Feb. 27, 1971, 2109460
Int. Cl. A44b 11/26
U.S. Cl. 24—230 AL 2 Claims

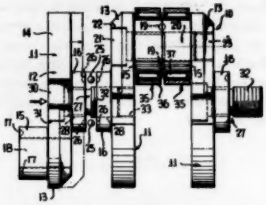


1. A buckle for a safety belt, the buckle comprising a housing enclosing a locking mechanism, a push button mounted in said housing and disengaging said locking mechanism, said housing receiving a flat tongue engaged by said locking mechanism and connected to the safety belt when directed into the buckle, said tongue provided with at least one indentation therein, said locking mechanism comprising a pair of lock plates, each provided with a guide groove extending perpendicularly to the direction of entry of the tongue in the buckle, said tongue moving in said buckle between said lock plates, and further comprising a latch member for reception in said indentation for engaging said tongue in said buckle slidably received in said grooves, the latch member biased in the locking position by a spring mounted in the buckle and coupled directly to the push button for movement on depression of said button perpendicularly to the movement of said tongue in said buckle, said buckle further comprising a pair of webs rigidly connecting said latch member to said push button, each web of said pair of webs being arranged parallel to said lock plates and on the outside of one of said pair of lock plates.

3,851,361
METHOD OF FORMING SECTIONAL CRANKSHAFT
Willard L. Bowen, III, Village Ln., Harwinton, Conn. 06790
Continuation of Ser. No. 207,742, Dec. 14, 1971, abandoned.
This application July 13, 1973, Ser. No. 378,823
Int. Cl. B21k 1/08
U.S. Cl. 29—6 4 Claims

1. A method of forming a sectional crankshaft having rod and main journals connected together by counter-weights comprising the steps of forming elements of a conventional type crankshaft as individual components including counterweight portions and journal portions having aligned axial bores, providing screw threaded fasteners of a size to fit said bores for passage through aligned bores of respective counterweight and journal portions to clamp the same together, and forming torsion transmitting connections between clamped together counterweight and journal portions in circumferentially spaced relation; said method particularly including the steps of forming each of said torsion transmitting connections

which includes forming axially aligned recesses in opposing surfaces of the crankshaft portions to be joined, at least one of said axially aligned recesses being formed of a shape other than cylindrical or part hemispherical, positioning a hardened ball between the crankshaft portions being joined in between and partially disposed in said axially aligned recesses, and then



utilizing the associated screw threaded fastener to draw the respective crankshaft portions together and thereby forceably seating said ball in said axially aligned recesses with at least said one recess being distorted by the pressing of the ball thereinto to effect an automatic firm seating of the ball therein.

3,851,362

EXPANDED MESH

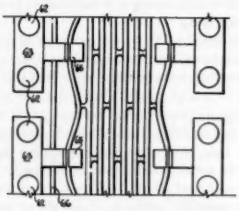
Harold Rex Jury, Norwood, and Ronald McKenzie Howells, Yennora, New South Wales, both of Australia, assignors to Comalco (J. & S.) Pty. Limited, New South Wales, Australia

Filed Aug. 20, 1973, Ser. No. 389,954

Claims priority, application Australia, Aug. 23, 1972, 0185/72

Int. Cl. B21d *31/04*

U.S. Cl. 29—6.1 **6 Claims**



1. A method of forming expanded mesh, comprising:

a. extruding extrusile material to form an extrusion having a constant cross-sectional shape which includes ribs separated by webs,

b. forming a row of slots in each web so that the slots of each row are staggered with respect to and overlap the slots of at least one adjacent row,

c. increasing the width of each slot in each of the two outermost rows of slots by bending at least one of the ribs flanking the respective slot,

d. engaging the hooks of two rows of hooks of an expanding machine in respective widened slots of respective said outermost rows of slots,

e. separating the rows of hooks from one another so as to bend the ribs and expand the slotted extrusion, and at the same time move the hooks in each row towards one another, and

f. removing the expanded mesh from the hooks.

3,851,363

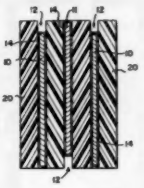
METHOD OF MAKING A CAPACITOR UTILIZING BONDED DISCRETE POLYMERIC FILM DIELECTRICS

James M. Booe, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 212,806, Dec. 27, 1971, abandoned, which is a division of Ser. No. 54,187, July 13, 1970, Pat. No. 3,649,892. This application Sept. 14, 1973, Ser. No. 397,240

Int. Cl. H01g *13/00*

U.S. Cl. 29—25.42 **7 Claims**



1. A method of making a capacitor including the steps of providing polymeric dielectric means having opposite sides, each of the opposite sides having a layer of adhesive binder thereon, contacting the adhesive binder layer on one side of the polymeric dielectric means with first electrode means and contacting the adhesive binder layer on another side of the polymeric dielectric means with second electrode means to offset edges of the first electrode means from adjacent edges of the second electrode means and to separate each of the electrode means in spaced relationship, moving the first and second electrode means and the polymeric dielectric means into intimate engagement to adhere each of the electrode means to the polymeric dielectric means and to move adhesive binder from between the polymeric dielectric means and the electrode means into the area of the adjacent offset edges to cover edges of the first and second electrode means, removing adhesive binder from the offset edges of the first electrode means to expose such edges and removing adhesive binder from the offset edges of the second electrode means to expose such edges at an end of the capacitor opposite the end with exposed edges of the first electrode means, the polymeric dielectric means and the adhesive binder cooperating to provide means separating the first and second electrode means capable of withstanding about 3,000 volts or more per mil between the first and second electrode means, and attaching terminal means to exposed edges of the first and second electrode means.

3,851,364

AUTOMATIC TOOL CHANGING ARRANGEMENT

Fritz Noa, Rheydt, and Manfred Mohren, Monchen-Gladbach, both of Germany, assignors to Schiess Aktiengesellschaft, Dusseldorf, Germany

Filed June 13, 1973, Ser. No. 369,752

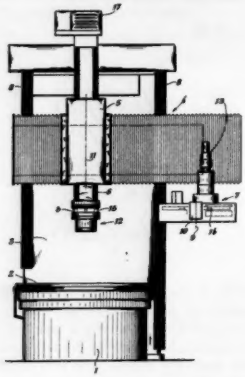
Claims priority, application Germany, June 21, 1972, 2230143

Int. Cl. B23q *3/157*

U.S. Cl. 29—26 A **9 Claims**

1. In an automatic tool changing arrangement for a machine tool having a frame with a tool support therein adapted to operatively support a tool head for performing machining operations and a tool storage magazine, said magazine having at least one tool head engaging means adapted nonrotatively to engage a tool head and to support the tool head in a predetermined position, said tool support being moveable in said frame into registration with said tool head engaging means to receive a tool head therefrom or to deliver a tool head thereto, said tool support having a nonrotatable housing, a sleeve coaxially disposed in the housing, a nut rotatable but nonaxially moveable on one end of the housing threadedly engaging said sleeve, a tool head at the other end of said housing, coop-

erating elements of a bayonet latch on the tool head and sleeve engageable and disengageable in response to relative rotary movement of said tool head and sleeve, cooperating elements of clutch means on said tool head and the other end of said housing engageable and disengageable in response to relative axial movement of said tool head and housing, first means for rotating said nut to move said sleeve axially in said



housing to engage or disengage said elements of clutch means associated with said nut, second means for rotating said sleeve in said housing while said tool head is nonrotatively engaged by said tool head engaging means on said magazine to engage or disengage said elements of a bayonet latch, and means operable while said elements of clutch means and bayonet latch are disengaged for moving said housing axially relative to said tool head engaging means.

3,851,365

ROLLING MILL WORK ROLL ASSEMBLIES

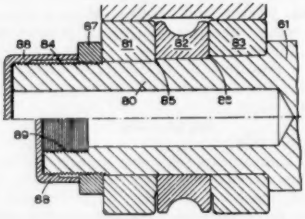
Roy Ronald Oxlade, London, England, assignor to The British Iron & Steel Research Association, London, England

Continuation of Ser. No. 881,801, Dec. 3, 1969, Pat. No. 3,803,683. This application Jan. 22, 1974, Ser No. 435,625

Claims priority, application Great Britain, Dec. 10, 1968, 58650/68The portion of the term of this patent subsequent to Apr. 16, 1991, has been disclaimed.

Int. Cl. B21b *31/08*

U.S. Cl. 29—125 **10 Claims**



1. A rolling mill work roll assembly comprising a hollow shaft member which is co-axially secured to or formed integrally with a work roll drive shaft and which extends co-axially in a bore of a work roll, said work roll including an annular member formed to define a rolling groove or surface of the work roll, said shaft member having a first end face and an axial hollow in said shaft member open at one end onto said first end face and closed at the other end, said closed end of said hollow presenting a first reaction surface, means integral with the shaft members adjacent said open end of said hollow to provide a second reaction surface facing in the opposite direction to said first reaction surface, whereby said hollow shaft member is adapted to be axially stretched by load applying means acting on and between said first and second reaction surfaces to cause sufficient diametrical reduction of said hollow shaft member to permit insertion and removal thereof into and from its assembled position in said work roll bore, said shaft member when not so stretched having a diameter too large to permit such insertion and removal, said shaft member thereby exerting radial loading outwardly on said work roll when the stretching force is removed, thereby determining radial location of said work roll with respect to said hollow shaft member.

3,851,366

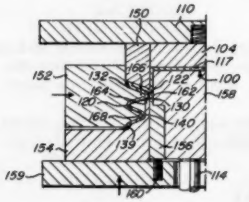
METHOD OF PULLEY MANUFACTURE

Orville W. Jacobs, Ludlow Falls, Ohio, assignor to The East Dayton Tool & Die Company, Dayton, Ohio

Filed Apr. 9, 1973, Ser. No. 348,953

Int. Cl. B21k *1/42*

U.S. Cl. 29—159 R **14 Claims**



1. The method of forming a V-belt pulley from a single sheet of metal, comprising:

drawing the sheet to form a cup-shape blank having a base and a peripheral portion at spaced-apart positions, with a wall extending between the base and the peripheral portion and with a plurality of well-defined break rings separating angular portions in the wall, there being a cylindrical part and a frusto-conical part in the wall, separated by a break ring; followed by collapsing and folding, one against the other, said frusto-conical part of the wall and a cylindrical part of the wall to form an entire one side of a groove; another portion of the sheet forming the other side of the groove.

3,851,367

MACHINE FOR INSTALLING PROBE ELEMENTS INTO LAMINATED FLOOR STRUCTURE

Walter L. Reid, Jr., Mattapoisett; C. Condit Peirce, Rochester, and Raymond G. Pelletier, New Bedford, all of Mass., assignors to Dole Electro-Systems, Incorporated, Palo Alto, Calif.

Filed June 15, 1973, Ser. No. 370,407

Int. Cl. H05k *13/04*

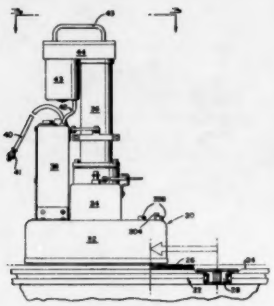
U.S. Cl. 29—203 R **28 Claims**

1. A machine for installing a receptacle unit or a similar connecting device with probe elements into a laminated floor structure having internal conductive layers, said machine comprising:

means for holding said unit so that its probe elements are positioned for being driven into the floor structure;

drive means for applying a downward force to the probe

elements of the unit;
and control means for discontinuing said downward force



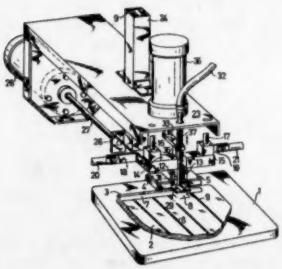
when the probe elements have penetrated into the laminated structure a predetermined depth.

3,851,368

ELECTRICAL CONNECTING TERMINAL

Siegfried Kuiff, Merkstein; Heinz Karla, Herzogenrath, and Gerd Frings, Merkstein, all of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Sept. 24, 1973, Ser. No. 400,062
Claims priority, application France, Oct. 9, 1972, 72.35648
Int. Cl. H01r *43/00;* **H05k** *13/04*
U.S. Cl. 29—203 R **23 Claims**



1. A method for welding a metal connecting terminal to an electrical insulator including welding by induction and the Joule effect comprising:

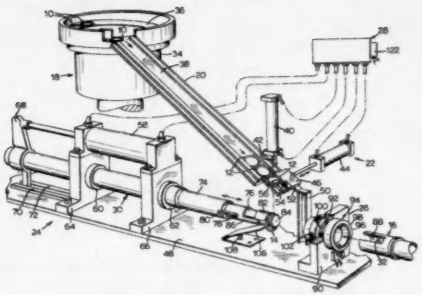
a. supporting said insulator in a predetermined plane;
b. maintaining at least one terminal in a magazine;
c. removing said terminal from said magazine;
d. transferring said terminal from said magazine to a first position in a plane above said predetermined plane;
e. moving said terminal to a second position onto said insulator; and
f. welding said terminal onto said insulator at said second position.

3,851,369

APPARATUS FOR APPLICATION OF RESILIENT SEALS

Harald Eschholz, Islington, Ontario, Canada, assignor to Dick Gordon Rockwell, Ontario, Canada

Filed May 18, 1973, Ser. No. 361,509
Claims priority, application Canada, Apr. 27, 1973, 170739
Int. Cl. B23q *7/10;* **B23p** *19/02*
U.S. Cl. 29—211 D **10 Claims**



1. Apparatus for placing a distensible annular component in a seat formed in a workpiece, the apparatus comprising:

feed means adapted to align the component with other similar components;

an escapement positioned to receive the component from the feed means;

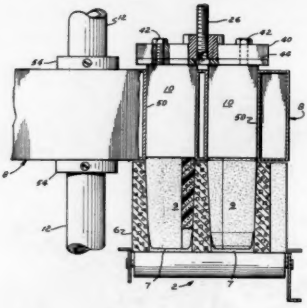
a transport mechanism including a plunger having an end portion below the escapement for receiving the component from the escapement with the plunger in a rest position, and an actuator coupled to the plunger to move the plunger axially to carry the component towards the seat in the workpiece, the plunger continuing to move until it reaches an extended position where the component is located adjacent the seat, whereupon further movement of the actuator causes the plunger to take up a strip position thereby causing the component to move into the seat;

the escapement comprising: a movable element adapted to receive the component off the feed means and to support the component above said plunger end portion; a further actuator coupled to the movable element to move said element between a guide position in which the element supports the component and a withdrawn position which permits the component to fall; a rod arranged for movement between a withdrawn position in which a lower end of the rod is above the movable element, and an extended position in which the rod projects through the component as the component rests on the movable element and in which said end of the rod is immediately adjacent the plunger end portion with the plunger in the withdrawn position; another actuator coupled to the rod to move the rod between said withdrawn and extended positions; and a sequential control system coupled to the respective actuators to move the actuators sequentially, whereby with the plunger in the withdrawn position, the movable element in the guide position, and the rod in the extended position, the component may be moved onto the plunger end portion by causing said further actuator to move the movable element into the withdrawn position whereupon the component falls onto the plunger end portion guided by the rod.

3,851,370
LINEAR INSERTING APPARATUS FOR MASONRY BUILDING BLOCKS

Eugene T. Laturnau, 5 Beekman Dr., Agawam, Mass. 01001

Filed Jan. 21, 1974, Ser. No. 434,795
Int. Cl. B23q *7/10;* **B23p** *19/04*
U.S. Cl. 29—211 R **5 Claims**



1. Apparatus for press-fitting plastic insulating liner insert forms into the hollow cells of masonry building blocks and the like comprising,

a framework having a top central section with vertical support means at each end thereof for mounting said top section in vertically elevated section over a block loading station platform surface above which said top section may be positioned, the support at one end thereof including a vertical pivot post,

said pivot post and vertical support at the opposite end having adjustable means for limited tilting and elevational variation in the positioning of said top frame section,

a motor operated power screw mechanism mounted on said horizontal top frame section having a pressure head below said section provided with a set of plunger members depending therefrom and vertically reciprocable below said frame section, and

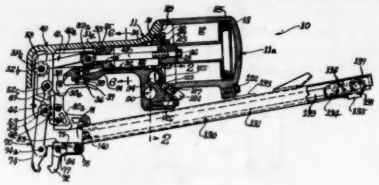
a liner insert form carrier rotatably mounted on the pivot post and having, radially of said post in angularly spaced relation on the carrier, at least two sets of vertically disposed through passages to receive liner insert forms, said sets of passages being sequentially indexible into underlying vertical alignment with said plunger members above the cells of masonry blocks at a loading station, said through passages holding the insert forms aligned for guided movement during downward travel of the plunger members for the seating of said forms in the cells.

3,851,371
PNEUMATICALLY OPERATED TOOL

Larry D. Plunkett, Crystal Lake, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Dec. 27, 1972, Ser. No. 318,822
Int. Cl. B23p *11/00;* **B21f** *15/06*
U.S. Cl. 29—243.56 **11 Claims**

1. A pneumatically operated clip tool comprising: a casing defining a first driving cylinder and a second retracting cylinder; a driving piston reciprocably mounted in said driving cylinder; a retracting piston reciprocably mounted in said retracting cylinder; means for providing driving fluid to said driving cylinder above said driving piston and for normally providing retracting fluid to said retracting cylinder below said retracting piston; a clip driver means operatively connected to said driving piston for driving a clip, means operatively connecting said driving and retracting pistons for conjoint movement in a first driving direction and in a second retracting direction; a clinching anvil disposed beneath said driver means, said clinching anvil comprising a fixedly positioned clinching jaw member mounted on said casing, and release means for readily releasing said clinching jaw member from its fixed position, thereby to provide free and full access from below said driver means; and manually operable valve means

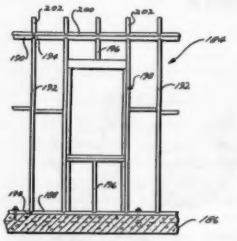


mounted on said casing for selectively introducing retracting fluid to said driving cylinder below said driving piston to assist in retracting said driver means and said retracting piston when said retracting fluid, piston and cylinder are ineffective to retract said driver means.

3,851,372
METHOD FOR MAKING FRAMING CONSTRUCTION WITH PRE-MORTISED PLATES

Charles E. Wirch, 1366 E. Palm, Altadena, Calif. 91001

Division of Ser. No. 199,959, Nov. 18, 1971, Pat. No. 3,744,540. This application July 5, 1973, Ser. No. 376,819
Int. Cl. B23p *19/00*
U.S. Cl. 29—428 **12 Claims**



1. A method of constructing the framing of a building comprising pre-mortising a group of elongated beams by forming notches across the width of each of the beams at longitudinally spaced apart locations along the length of each beam,

forming a framed wall panel by arranging the pre-mortised beams to provide a bottom plate of the wall panel and an upper plate of a panel spaced from and extending generally parallel to the bottom plate with the notches of the upper plate being aligned longitudinally with the notches of the bottom plate, and placing the ends of a series of spaced apart and parallel elongated studs in the aligned notches, and

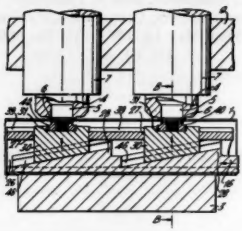
fastening the ends of the studs to the notched portions of the plates to form a rigid framed wall panel in which the studs extend vertically between the bottom plate and upper plate when the wall panel is mounted in an upright position for providing the wall framing for the building.

3,851,373

METHOD AND APPARATUS FOR ATTACHMENT OF A NUT IN THE INSIDE WALL OF A PIPE

Katsumi Shinjo, 8,6-chome, Asahiminamidoori, Nishinariku, Osaka, Japan

Filed Sept. 6, 1973, Ser. No. 394,663
Int. Cl. B23p *19/00, 11/00*
U.S. Cl. 29—432.2 31 Claims



1. Apparatus for attaching a nut to a wall of a pipe; said apparatus comprising:

a die having swaging blade means,

die moving means for moving said die to and from a die operating position immediately adjacent and in facing relationship to an outside surface portion of a wall of a pipe,

nut holder means for holding a nut,

nut holder moving means for moving said nut holder means to and from a nut holder operating position inside of said pipe in facing relationship to an inside surface portion of said wall of said pipe which is directly opposite said die operating position,

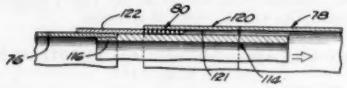
and pressing means for pressing said nut holder means in an outward direction transverse to the surface of said wall with sufficient pressure that a nut in said nut holder means punches its own installation aperture in the wall with said die providing a backing force for said nut and with said swaging blade means effecting a swaging of material of said wall around said aperture into grooves provided on said nut for anchoring said nut in said wall.

3,851,374

METHOD OF ASSEMBLYING ENERGY ABSORBERS

Bernard Mazelsky, West Covina, Calif., assignor to ARA Products, Inc., West Covina, Calif.

Filed Dec. 1, 1972, Ser. No. 311,299
Int. Cl. B21d *39/00;* B23p *19/04*
U.S. Cl. 29—455 8 Claims



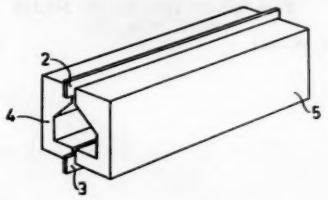
1. A method of assembling energy absorbers of the type comprising cylindrical telescoping members having circular energy absorbing means in the annular space between the members, comprising the steps of: positioning the circular elements adjacent to each other about an axis by winding a continuous element into convolutions about a cylindrical dummy member having an axis coinciding with said axis; aligning the inner and outer telescoping members with said axis; positioning said dummy member between said telescoping members; and moving the inner and outer telescoping members axially relatively to push the circular elements axially off said dummy member and onto said telescoping member in a position between said telescoping members thereby to cause the circular elements to be positioned in the annular space between the telescoping members.

3,851,375

METHOD OF BONDING TOGETHER MOULDINGS OF SINTERED OXIDIC FERROMAGNETIC MATERIAL

Jacob Koorneef, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

Continuation of Ser. No. 250,878, May 8, 1972, abandoned.
This application Feb. 11, 1974, Ser. No. 441,575
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.9 3 Claims



1. A method of bonding together a plurality of mouldings of a sintered oxidic ferromagnetic material comprising the steps of:

A. placing a metallic spacing member composed of a lead-tin alloy between said mouldings;

B. heating the resulting assembly of (A) to a temperature between approximately 145°C and 165°C for a period between approximately 1 and 10 minutes;

C. concurrently with the heating step of (B), subjecting said assembly to a mechanical pressure between approximately 50 and 150 kg/sq.cm., until said spacing member and said mouldings are bonded together; and

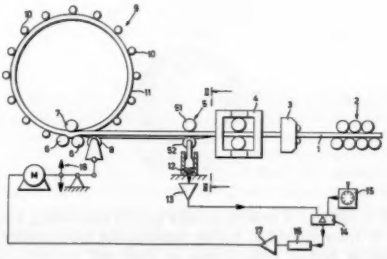
D. cooling said assembly and removing said pressure.

3,851,376

METHOD FOR PRODUCING HELICAL SEAM WELDED STEEL PIPE

Heinz Gross, Reichsmarkstrasse 142, 4600 Dortmund-Syburg, Germany; Harry C. Wade, 1205 Fennel St. E. No. 104, Hamilton, Ontario, and John W. Witts, 20 Damode Dr., Fonthill, Ontario, both of Canada

Filed Apr. 30, 1973, Ser. No. 355,663
Claims priority, application Germany, May 4, 1972, 2221776
Int. Cl. B23k *31/02*
U.S. Cl. 29—477.3 2 Claims



1. Method of producing helical seam welded pipe from strip material comprising the steps of bending the strip material into a helical form by plastic deformation and welding the

oppositely disposed juxtaposed edges of the strip material together, wherein the improvement comprises, prior to bending the strip into helical form, continuously measuring the deformation resistance of the strip, and adjusting the bending operation in accordance with the measured deformation resistance so that the spring back of the strip material remains within permissible limits regardless of the variations in the strip material properties along its length.

3,851,377

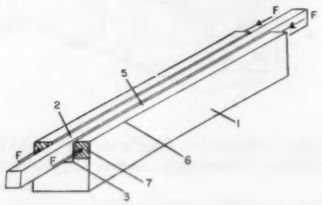
SEALING OF METAL BARS IN CARBONIZED BLOCKS

Daniel Dumas, 6 route d'Heyrieux, Saint Priest; Georges Hoynant, 145 Chemin de Choulans, and Jean Vallon, 33 rue Saint-Jean, both of Lyon, all of France

Filed Mar. 27, 1973, Ser. No. 345,311

Int. Cl. B23k *1/20*

U.S. Cl. 29—493 **8 Claims**



1. A method for producing a carbonized block having a metal bar sealed therein for establishing good electrical contact therebetween including the steps of providing the block with a longitudinal groove in one surface thereof, arranging the bar in said groove, preheating the block and bar to elevated temperature, and pouring liquid metal into the groove around the bar, applying a longitudinal compressive stress of an intensity at least equal to the resistance at break under traction of the block material to at least portions of the block adjacent the groove, said compressive stress being applied prior to metal pouring and maintained during at least an initial portion of the cooling time.

3,851,378

METHOD OF CONSTRUCTING CABLE TRAY

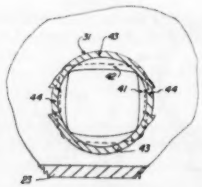
Jean Marcel Dessert, Calgary, Alberta, Canada, assignor to Renn-Cupit Industries Ltd., Alberta, Canada

Filed Nov. 2, 1972, Ser. No. 303,038

Claims priority, application Canada, Aug. 29, 1972, 150503

Int. Cl. B21d *39/00;* **B23p** *11/02*

U.S. Cl. 29—523 **6 Claims**



1. A method of making a cable tray by assembling a plurality of cross members, having non-circular cross-section and being of hollow construction at their end portions, transversely between spaced longitudinally extending side rails provided with a plurality of aligned longitudinally spaced openings, said method including passing said cross members through opposed aligned openings in said side rails, inserting a cold forming tool into each of said hollow end portions of each of said cross members and rotating said tool whereby two spaced, peripheral flanges are simultaneously formed at each end portion in clamping arrangement with and on opposed faces of said side rails.

3,851,379

SOLID STATE COMPONENTS

Peter Gutknecht, Santa Ana, Calif.; Terrence M. S. Heng, and Harvey C. Nathanson, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 16, 1973, Ser. No. 360,996

Int. Cl. B01j *17/00*

U.S. Cl. 29—571 **9 Claims**

1. The method of producing from a blank a field-effect transistor (FET), capable of operating at microwave frequencies and of handling substantial power at said frequencies, the said blank having a substrate doped with carriers of a first polarity and having a first layer thereon doped with carriers of opposite polarity, said first layer having a second layer thereon doped with carriers of said first polarity, the said method comprising preparing on said second layer a pair of spaced regions, at least one of said regions having a surface for deposit thereon of a drain electrode, forming a groove in said blank between said prepared regions, each of said regions overhanging said groove a predetermined distance, said groove penetrating to said substrate, depositing a coating of an electrically insulating material on the surface of said groove, depositing a gate electrode on said coating by projecting, on the part of said coating under said one region, a linear beam of a metal vapor at an angle to said surface from that direction of the region of the pair other than said one region and permitting said vapor to solidify, adjacent to and under the overhang of said one region, said beam being shadowed by said overhangs of said regions so that said gate electrode is deposited substantially only opposite the edge of said first layer extending along said groove; and depositing said drain electrode on said surface.

3,851,380

MACHINE TOOL WITH TOOL MODULE STORAGE AND CHANGING MEANS

Mikishi Kurimoto, 114-10, Arimatsuura, Narumi-cho, Midoriku, Nagoya-shi, Aichi-ken; Yoshiki Ochiai, 29, Kitatouraku, Fukuoka-cho, Okazaki; Kenji Nomura, 42-1, Kitashinden, Ogawa, Higashiura-cho, Aichi-ken, and Toshio Inagaki, 30, Yamanaka, Ogawa-cho, Anjo, all of Japan

Filed Apr. 13, 1973, Ser. No. 350,717

Claims priority, application Japan, Apr. 13, 1972, 47-37269

Int. Cl. B23q *3/157*

U.S. Cl. 29—568 **5 Claims**

1. A machine tool, comprising:

a column;

a housing slidably mounted on said column, said housing having a rotatable spindle;

a frame providing a horizontal pivot;

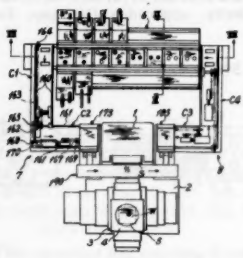
a polygonal storage magazine mounted rotatably about said horizontal pivot and having a plurality of axial guide ways on the periphery thereof, each of said guide ways slidably carrying in a queue line a plurality of tool modules to perform a number of different machining operations on a workpiece;

a first transfer means located between one side of said polygonal storage magazine and said column for conveying a new tool module from said storage magazine for use

at said rotatable spindle;

a second transfer means located between another side of said storage magazine and said column for conveying a tool module which has just been used at said rotatable spindle back to said storage magazine;

an index means for rotatably indexing said polygonal storage magazine so as to connect a selected guide way to said first and said second transfer means at both ends thereof;



a feed means mounted on said frame for feeding said new tool module from the front of said queue line on said selected guide way to said first transfer means and immediately to feed said used tool module from said second transfer means to the end of said queue line; and

a changing means mounted on said column to remove said used tool module from said rotatable spindle and immediately to move said new tool module to said rotatable spindle.

3,851,381

METHOD FOR MANUFACTURING THERMOELECTRIC MODULES

Michel Alais, and Andre Stahl, both of Orsay, France, assignors to Compagnie Industrielle des Telecommunications CIT-ALCATEL, Paris, France

Filed Nov. 9, 1973, Ser. No. 414,304

Claims priority, application France, Nov. 9, 1972, 72.39753

Int. Cl. B01j *17/00*

U.S. Cl. 29—573 **6 Claims**

1. Method for manufacturing thermoelectric modules by collective welding of the thermocouples from blocks of P type and N type material having a parallelepipedic shape and having the same dimensions and a predetermined granulometry comprising:

cutting respective masses of semiconductor material parallelepipedic blocks parallel to one of their faces in strips of P type material and strips of N type material;

assembling alternately the same number of strips of P type and of N type material;

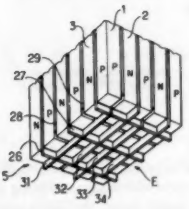
inserting between the adjacent faces of said strips insulating sheets which are very thin and have the same width as said strips to form a parallelepipedical P and N stack;

cutting the P and N stack into thin slices in a direction perpendicular to the faces of the P and N strips to form a series of rods;

forming a parallelepipedic stack by assembling in parallel a certain number of these slices after having inserted between the adjacent faces, very thin insulating sheets so as to place successively a slice beginning with a P rod and a slice beginning by an N rod;

establishing conductive connections between the P and N rods;

characterized in that the insulating sheets inserted between the P strips and N strips during the first inserting step have a height slightly greater than that of the strips and are arranged alternately so as to be substantially flush with one face of the P stack and N stack and overlapping slightly on the other face, and in that the insulating sheets inserted between each slide during the second inserting step overlap slightly on the two opposite faces of the stack and have, at their lower corner, a rectangular cutaway



part arranged alternately on the right hand and on the left of the stack, said step of establishing connections being effected by dipping of the said two opposite faces of the stack in brazing material.

3,851,382

METHOD OF PRODUCING A SEMICONDUCTOR OR THICK FILM DEVICE

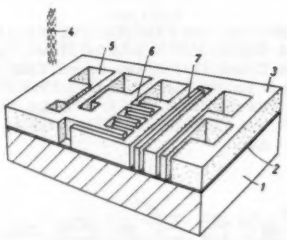
Fritz Stork, Grossgartach, Germany, assignor to Telefunken Patentverwertungsgesellschaft GmbH, Danube, Germany

Division of Ser. No. 881,150, Dec. 1, 1969, Pat. No. 3,705,060. This application July 24, 1972, Ser. No. 274,241

Claims priority, application Germany, Dec. 2, 1968, 1812130

Int. Cl. B01j *17/00*

U.S. Cl. 29—578 **12 Claims**



1. A method of producing a semiconductor or thick film device, comprising the steps of providing a thin metal layer on one surface of an at least partially insulating body, forming a layer of plastics material which is resistant to etching, temperature resistant, and insensitive to light on said thin metal layer, guiding an electron beam over said plastics layer, controlling said beam so as to remove predetermined areas of said plastics layer for forming apertures in said plastics layer, depositing further metal, either by electro-deposition or without current, on the areas of said thin metal layer thus exposed until said apertures have been at least partially filled with said further metal, removing said plastics layer with a solvent, and removing the areas of said thin metal layer which have not had said further metal deposited thereon in an etching solution.

3,851,383

METHOD OF CONTACTING A SEMICONDUCTOR BODY HAVING A PLURALITY OF ELECTRODES UTILIZING SHEET METAL ELECTRIC LEADS

Hanns-Heinz Peltz, Worthstr. 23, 8 Munich 80, Germany

Division of Ser. No. 164,999, July 22, 1971, Pat. No. 3,795,044. This application Dec. 10, 1973, Ser. No. 423,466
Int. Cl. B01j 17/00
U.S. Cl. 29—591 1 Claim

1. A method of contacting a semiconductor body which is provided with several electrodes, utilizing a system of electric leads made of a metal sheet, the leads extending tongue-like from a holder frame into the interior of the frame and having the tongue ends for conductive connection with individual electrodes, comprising the steps of applying a complete mask of photo-varnish to one side of a metal sheet to be converted to the system of leads which mask covers only the sheet portions which are subsequently to form the holder frame and all of the tongue-like leads; applying an incomplete photo-varnish mask to the other side of the sheet which mask covers only those portions of the sheet metal corresponding to the holder frame and the parts of the tongue-like leads adjacent the holder frame; etching depressions into the metal sheet using the photo-varnish masks as etching masks; supplementing the incomplete photo-varnish mask so that it also corresponds to the free ends of the tongue-like leads of the complete mask and so that the two masks coincide with each other; continuing the etching process with the assistance of the two then complete masks until the sheet portions corresponding to the tongue-like leads are clearly separated from each other along their entire lengths; placing the semiconductor body and its electrodes into contact with the ends of the tongue-like leads having dimensions corresponding to the corresponding dimensions of the electrodes; and permanently joining the ends of the tongue-like leads and the electrodes.

3,851,384

PROCESS FOR FABRICATING WALLS

Raymond M. Kellner, 4505 N. Brawley, Fresno, Calif. 93705, and Minor E. Gee, 1231 Hawley, Sanger, Calif. 93657

Division of Ser. No. 865,742, Oct. 13, 1969, Pat. No. 3,688,965. This application Mar. 1, 1972, Ser. No. 231,055
Int. Cl. E04b 2/70; B23p 21/00
U.S. Cl. 29—430 10 Claims

1. In a process for fabricating a wall of a type including a pair of wall plates arranged in substantial parallelism and a plurality of vertical support components extended between the plates, the steps comprising:

A. intermittently advancing a pair of wall plates along a pair of substantially parallel paths through an assembly station;

B. serially delivering a plurality of vertical support components along a common linear path into simultaneous engagement with said plates at said assembly station, said common linear path being extended from a source of vertical support components to said assembly station between said plates in substantial coplanar relation and in parallelism with said pair of parallel paths; and

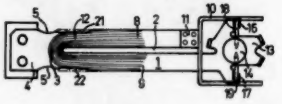
C. affixing each of said components to each of said plates at said assembly station while said plates are at rest.

3,851,385

METHOD OF ADJUSTING THE FREQUENCY OF TRANSVERSE VIBRATORS HAVING A PLURALITY OF LEGS

Alfred Meisner, Nurnberg, and Walter Spitzl, Heroldsberg, both of Germany, assignors to Diehl, Nurnberg, Germany

Filed Dec. 26, 1972, Ser. No. 318,570
Claims priority, application Germany, Dec. 24, 1971, 2164643
Int. Cl. H02k 15/00
U.S. Cl. 29—596 6 Claims



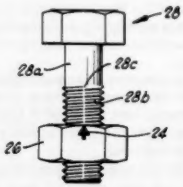
1. A method of adjusting and balancing the frequency and frequency symmetry, respectively, of a transverse flat fork vibrator which comprises a normally flat element in substantially one plane having a connecting flap at one end, a foot portion integral with said flap and a pair of legs extending from said foot portion and terminating in free ends and which vibrate perpendicularly to the plane of said vibrator, said legs being spaced by a slot extending from said foot portion to said free ends of said legs, said method comprising selectively removing material from the outer edges of said legs at their junction with said foot portion and opposite the end of said slot adjacent said foot portion, to reduce the frequency of vibration of said legs to a predetermined frequency and to equalize the vibration frequencies of the pair of legs.

3,851,386

METHOD OF TENSIONING BOLTS

Lucian L. Ellzey, Jr., 6909 N. Grove, Oklahoma City, Okla. 73127

Filed Aug. 31, 1973, Ser. No. 393,412
Int. Cl. B23q 17/00
U.S. Cl. 29—407 8 Claims



1. The method of tensioning a nut-bolt combination comprising the steps of:

placing a first indexing mark in a visible location on a portion of the nut-bolt combination;

placing a second indexing mark at a predetermined location on a non-moving member which is juxtapositioned with respect to the portion of said nut-bolt combination carrying said first mark as the bolt of the combination is tensioned for joining two members together, said second indexing mark being positioned on said non-moving member at a location such that said first and second indexing marks are aligned when the bolt has been properly tensioned;

screw tightening the nut-bolt combination until the nut and the bolt head thereof are in positions of contact with the members to be joined by use of the nut-bolt combination; and then

rotating the portion of said nut-bolt combination which carries said first indexing mark to tension the bolt, and continuing said rotation for a predetermined and specified number of complete rotations, and, in addition, effecting such further rotation of the head of the bolt as is needed to bring said first and second index marks into alignment.

3,851,387

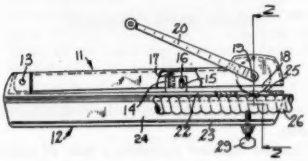
SHIELDED CONDUIT CUTTING DEVICE

Lucien C. Ducret, 61 Marlin Dr., Norwalk, Conn. 06854

Continuation-in-part of Ser. No. 216,941, Jan. 11, 1972, abandoned. This application May 25, 1973, Ser. No. 364,113

Int. Cl. B21f *13/00*

U.S. Cl. 30—90.3 **3 Claims**



1. A hand-held device for cutting the shielding of a shielded conduit, comprising:

a first elongated handle member;

a radial cutter head carried by said first member and arranged to cut parallel to the longitudinal axis of said member;

a second elongated handle member hingeably connected to said first member, whereby said members are positionable longitudinally adjacent one another, said second member having a shielded conduit-receiving cavity therein, the wall of said cavity adjacent said first member having a slit therethrough for passage of said cutter head into cutting contact with the shield of a shielded conduit in said cavity;

a stop member to limit the extent of passage of said cutter head through said slit;

means for rotating said cutter head; and

clamping means comprising a screw in said wall of said cavity, said screw being adapted for advancement on a line generally parallel to the cutting plane of said cutter head and for contact with said conduit at a point offset from both said cutting plane and the center of said conduit, said wall having a first wall portion and a second wall portion, said first wall portion sloping on a plane inwardly of said cavity to define an apex at the junction of said first and second wall portions, said apex being positioned in proximity to said cutting plane on the opposite side thereof from said point of contact of said conduit with said screw such that the center of any conduit wedged in said cavity is generally on a line bisecting said apex, whereby said conduit can be tightly wedged into said cavity in proximity to said cutting plane and said shielded conduit is maintained in cutting contact with said cutter head upon closing together of said handle members.

3,851,388

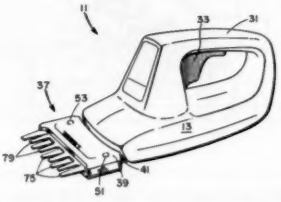
DETACHABLE BLADE ASSEMBLY FOR GRASS SHEAR

Edwin Joseph Weber, 2304 Ellen Ave., Baltimore, Md. 21234, and Ralph James Secoura, 5201 Disney Ave., Baltimore, Md. 21225

Filed June 19, 1973, Ser. No. 371,404

Int. Cl. B26b *19/06*

U.S. Cl. 30—223 **1 Claim**



1. A cartridge blade assembly for a power operated, shear device, said blade assembly including a blade housing having a stationary blade secured thereto, said stationary blade having laterally spaced, shearing teeth extending forwardly of said housing, a movable blade slidably guided on said stationary blade, said movable blade having laterally spaced, shearing teeth substantially overlaying the shearing teeth on said stationary blade, said bl. es being relatively inflexible and inclined toward one another so that said shearing teeth intersect one another, means normally biasing said blades toward said inclined, shearing relation, said means including an elongated leaf-type spring carried by and extending transversely of said housing, a plurality of balls between said spring and said movable blade, said spring and said movable blade being provided with transverse recesses receiving and retaining each of said balls in lateral rolling relation, said spring acting through said balls to bias said movable blade toward said stationary blade, whereby to maintain said cutting teeth in shearing relation and minimize friction between the parts.

3,851,389

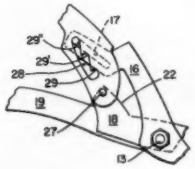
MULTIPLE ADJUSTMENT SHEAR

Leopold G. Swanson, 2125 James St., Martinez, Calif. 94553

Filed Aug. 29, 1973, Ser. No. 392,768

Int. Cl. B26b *13/26*

U.S. Cl. 30—250 **10 Claims**

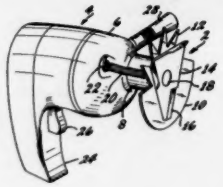


1. A hand operated shear including first and second opposed blades pivotally joined together at a first pivot, each of said blades having first and second blade stems, respectively, a moveable handle pivotally secured to said first stem at a second pivot, said movable handle including a first slot having a plurality of detents therein, and said second blade stem including a second slot therein, and a pin releasably extending through both of said slots and retained in one of said detents.

3,851,390
TRIMMING ATTACHMENT

Albert D. Neal, 17272 Blue Fox Cir., Huntington Beach, Calif. 92647

Filed Jan. 21, 1974, Ser. No. 435,325
Int. Cl. B26b *25/00;* **A01d** *55/18*
U.S. Cl. 30—276 **12 Claims**

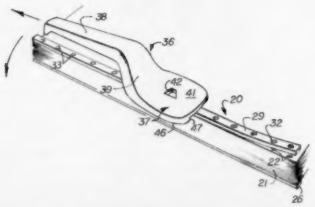


1. A trimming attachment for use with a power operated drill, said trimming attachment comprising:
   a restrained blade having a plurality of teeth;
   an outer support surface on said restrained blade;
   means for fixing the rotational position of said restrained blade with respect to a power operated drill;
   a rotatable blade having an inner surface which is complementary to the outer support surface of said restrained blade;
   said rotatable blade positioned with said inner surface in sliding engagement with said outer support surface;
   drive means which are connectable with the output shaft of a power operated drill, and
   said drive means connected to said rotatable blade through connecting means which transmit rotational movement from said drive means to said rotatable blade while holding the rotatable blade against the restrained blade and permitting rocking movement of the rotatable blade such that the inner surface of the rotatable blade is slidably engaged with said outer support surface and supported by said outer support surface,
   whereby material to be cut extends through the teeth on the restrained blade and is held by the teeth while being contacted and severed by coaction between the rotatable blade and the teeth on the restrained blade.

3,851,391
DEBINDING TOOL

Theodore A. D'Addario, Pleasanton, Calif., assignor to Velo-Bind, Inc., Sunnyvale, Calif.

Filed Apr. 16, 1973, Ser. No. 351,771
Int. Cl. B26b *3/00*
U.S. Cl. 30—280 **5 Claims**

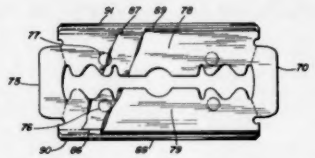


1. A tool for debinding a bound document of the type comprising a plurality of sheets formed with apertures spaced a short distance inward of one margin thereof, a first narrow strip overlying said apertures and having studs projecting through said apertures, a second narrow strip overlying said apertures on the side of said document opposite said first strip and means securing said studs to said second strip, said tool comprising a distal portion and a handle, said distal portion having a bottom, a guide rib projecting substantially perpendicularly below said bottom shaped to fit alongside the edge of one of said strips, a blade having a cutting edge and blade attachment means securing each end of said blade to said distal portion vicinal said guide rib with said blade and said cutting edge disposed parallel to said bottom and extending obliquely to said guide rib, said blade spaced from said bottom a distance at least as great as the thickness of one of said strips.

3,851,392
SHAVING UNIT FOR SAFETY RAZOR

William M. Donovan, Orange, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 13, 1973, Ser. No. 424,511
Int. Cl. B26b *21/54, 21/22*
U.S. Cl. 30—346.58 **14 Claims**



1. A shaving unit for a double edge safety razor, said shaving unit comprising:
   a. a first flexible member including a pair of transversely extending opposite sides, each one of the first member opposite sides having a cutting edge, and a pair of spaced end tabs, each one of said tabs extending outwardly from an opposite end of said first member:
   b. a second flexible member including a pair of transversely extending opposite sides, each one of the second member opposite sides having a cutting edge, and a pair of spaced end tabs, each one of said tabs extending outwardly from an opposite end of said second member, said second member being positioned above said first member with the cutting edges of said second member being positioned upwardly and outwardly of the cutting edges of said first member;
   c. a transversely elongated aperture between said tabs of said first member and said second member and vertically extending through said shaving unit for locating said shaving unit in said safety razor; and
   d. means solely between said aperture and the cutting edges to each side of said aperture for permanently connecting said first member and said second member together;
   e. whereby said first member and said second member are connected together at substantially flat surfaces, and said tabs are curved when said unit is seated in said safety razor.

2. The shaving unit of claim 1 further comprising means between said first member and said second member for vertically spacing said second member from said first member.

3,851,393
ORAL IMPLANT

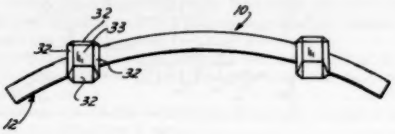
Charles M. Weiss, and Isiah Lew, both of New York, N.Y., assignors to Oratronics Incorporated, New York, N.Y.

Filed Sept. 28, 1973, Ser. No. 401,629
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 A **20 Claims**

1. In an oral implant for permanently implanting an artificial tooth supporting structure in the frontal jawbone segment of a patient's mouth comprising

A. a relatively thin blade portion having a relatively narrow edge adapted to be seated directly into the frontal jawbone segment to a suitable depth, and

B. a comparatively massive support portion substantially wider than said blade portion operatively connected thereto and adapted to extend therefrom outwardly of the frontal jawbone segment for mounting an artificial tooth structure, the underside of said support portion nearest said blade portion having a shoulder surface adapted to seat on a corresponding surface of the frontal jawbone segment, whereby engagement of said shoulder surface



with the bone surface provides an automatic limitation on insertion depth and increased lateral stability;

the improvement wherein said blade portion has a horizontal convex curvature equivalent to the average curvature of the frontal jawbone segment and a horizontal length equivalent to at least two adjacent dental roots in the frontal jawbone segment, and wherein the axes of said blade portion and said support portion form an included angle deviating from 180° to permit said support portion to be substantially vertical when said blade portion is driven into the frontal jawbone segment at an angle to the vertical.

3,851,394

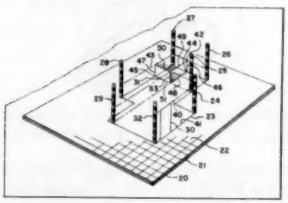
PERSPECTIVE POLE

James E. Ihms, 1569 W. Hazelwood, Phoenix, Ariz. 85015

Filed Mar. 14, 1973, Ser. No. 340,960

Int. Cl. B43l *13/14*

U.S. Cl. 33—1 K **2 Claims**



1. A method for drafting perspective views of three dimensional objects depicted in drawings, said method comprising the steps of:

A. laying the drawing upon a base plate;

B. positioning a grid system adjacent said drawing;

C. mounting a plurality of graduated poles at selected points on said grid;

D. displaying an image of the structure produced in accordance with steps A–C, the angle and depth of said image corresponding to the perspective view to be drawn;

E. tracing the X and Y axis dimensions of the object depicted by said drawing; and

F. drawing a plurality of lines keyed to the vertical gradations of said poles, said plurality of lines determining the Z axis dimensions of the object depicted by said drawing; whereby, the combination of traced and drawn lines depict the object in perspective.

3,851,395

APPARATUS FOR MEASURING MOVEMENT OF A FERROMAGNETIC MEMBER

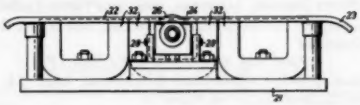
Maurice Noel Lapper, Carmarthen, Wales, assignor to British Steel Corporation, London, England

Filed Nov. 29, 1972, Ser. No. 310,443

Claims priority, application Great Britain, Dec. 3, 1971, 56286/71

Int. Cl. G01b *19/06*

U.S. Cl. 33—141 B **6 Claims**



1. Apparatus responsive to movement of a ferromagnetic member with which in operation it is in contact, comprising: a rotor; magnet means for magnetically attracting the ferromagnetic member into contact with the rotor; a surface over which in operation the ferromagnetic member passes, the surface having a gap through which part of the circumference of the rotor projects, the surface being of non-magnetic material, the magnet means being disposed beneath the surface both in front of and behind the rotor viewed in the direction of movement of the ferromagnetic member; and means for generating a pulse train in dependence upon rotation of the rotor in response to movement of the ferromagnetic member.

3,851,396

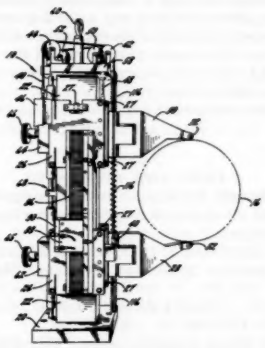
MEASURING GAGE FOR TURNING MACHINES AND THE LIKE

Steven Eldor Klabunde, Fond Du Lac, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed June 1, 1973, Ser. No. 365,961

Int. Cl. G01b *5/08, 5/10*

U.S. Cl. 33—143 L **6 Claims**



1. An in-process measuring gage for use with a turning machine or the like, comprising in combination, a base, a column extending outwardly from said base, a pair of arms slidably carried by said column, said arms having ends projecting outwardly substantially perpendicular to the column, contact means at the outer ends of each of said arms for engaging a rotating workpiece between said arms, means for normally biasing said arm means toward one another for maintaining continuous engagement with a workpiece disposed between said arms by said contact means, signal generating means connected to said arms for producing an output indicative of the relative spaced apart position of said arms

and any changes in relative spaced apart position of said arms, each of said arms including a clamp member and means fixed with respect to said column for engagement by said clamp members so that said arms may be set in predetermined positions spaced apart from one another, and said fixed means includes means for imparting a limited amount of float so that when said arms are clamped to said fixing means the arms are free to move by said limited amount of float.

3,851,397
MICROMETER WITH DIGITAL READING

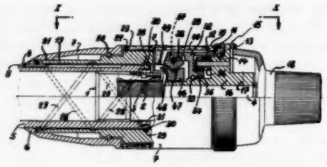
Jean-Pierre Jeannet, Lausanne, and Jean-Pierre Leuba, Renens, both of Switzerland, assignors to Tesa S. A., Renens, Switzerland

Filed Aug. 6, 1973, Ser. No. 386,177

Claims priority, application Switzerland, Sept. 24, 1972, 13916/72; June 25, 1973, 9234/73

Int. Cl. G01b *3/18*

U.S. Cl. 33—166 **9 Claims**



1. A micrometer with digital reading comprising:
a. a movable micrometer screw threadedly engaged in a fixed support;
b. a sleeve movably disposed on said fixed support, said sleeve axially fixed to said micrometer screw and angularly coupled to said fixed support;
c. a tubular element rotatably positioned within said sleeve, said tubular element axially coupled to said sleeve for simultaneous longitudinal movement threwith, said tubular element also coupled ro said fixed support by at least a helical groove and a stud slidably introduced in said helical groove whereby any axial displacement of the sleeve upon actuation of the micrometer screw causes the rotation of the tubular element in said sleeve;
d. at least a series of digits arranged on the periphery of said tubular element; and
e. a window disposed in said sleeve for viewing said digits.

3,851,398
GEAR TEST APPARATUS

Walter Hilburger, Nurtingen, Germany, assignor to Metabowerke KG Closs, Rauch & Schnizler, Burtingen/Wurttemberg, Germany

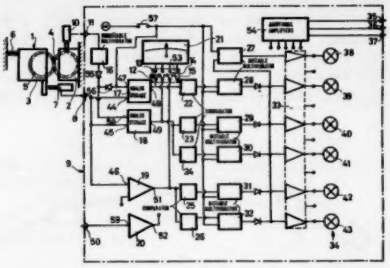
Filed Mar. 5, 1973, Ser. No. 338,015

Claims priority, application Germany, Mar. 7, 1972, 2210881

Int. Cl. G01b *5/20, 7/26*

U.S. Cl. 33—179.5 B **13 Claims**

1. In gear testing apparatus having a sliding carriage whose movement in a predetermined direction is a function of gear errors in the gear under test in combination, first sensing means for sensing said movement of said carriage and furnishing corresponding first signals; second sensing means for furnishing a second signal in response to passage of each gear tooth of said gear passed a predetermined location; first and second analog storage means each having an input connected to said first sensing means for storing said carriage movement signal, said first analog storage means further having a reset input connected to said second sensing means; first amplifier means connected to the output of said first sensing means; a plurality of comparator means for comparing the outputs of said first and second analog storage means and said first amplifier means to corresponding limiting values and furnishing a comparator output signal when any of said outputs passes the corresponding limiting value; and a plurality of indicator



means each connected to a corresponding one of said comparator means for furnishing indications of said comparator output signals.

3,851,399
ALIGNING EQUIPMENT IN SHIPS AND OTHER STRUCTURES

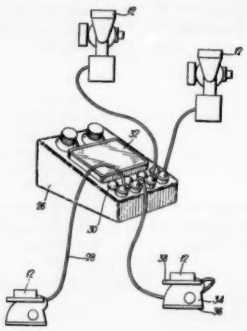
Christopher S. Edwards, Hitchin, England, assignor to British Aircraft Corporation Limited, London, England

Division of Ser. No. 254,115, May 17, 1972, abandoned. This application Sept. 14, 1973, Ser. No. 397,422

Claims priority, application Great Britain, May 18, 1971, 15591/71

Int. Cl. G01c *9/06, 9/26*

U.S. Cl. 33—228 **1 Claim**



1. A method of obtaining information for use in establishing the alignment of equipment on a structure, using instruments each of which has a sensitive axis and gives an electrical signal which, for a range of attitudes, is a function of the magnitude of the angle between that axis and the direction of the earth's gravitational field at any moment, the method comprising:
a. installing a first such instrument on the structure, either on a first mounting or on a piece of equipment, with provision for rotation of the instrument relatively to the structure about a rotation axis which is approximately vertical, the sensitive axis being perpendicular to this rotation axis,
b. likewise installing a second such instrument on said structure on a second mounting or piece of equipment,
c. bringing the two instruments to rotational positions about their rotation axes each with its sensitive axis approximately aligned with a common direction in the structure,

and taking the instantaneous difference of the signals of the two instruments,

thereby obtaining an output the magnitude and polarity of which varies in accordance with the magnitude and polarity of the angle between the rotation axes when projected onto the vertical plane containing the common direction,

d. thereafter rotating each instrument about its respective rotation axis in the same polarity through the same angle, and again taking the instantaneous difference of the signals of the two instruments,

e. adjusting at least one mounting or piece of equipment, having regard to the differences taken under steps (c) and (d), so as to bring the rotation axes into exact parallelism,

f. tilting the structure about a horizontal axis into an inclined attitude such that the rotation axes are substantially out of the vertical,

g. taking the instantaneous difference of the signals of the two instruments while the structure is in this inclined attitude, and

h. rotating one of the instruments about its rotation axis until the difference is zero.

3,851,400
SIGHTING DEVICE FOR ARTILLERY GUNS

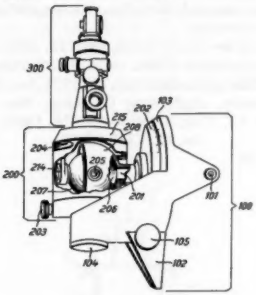
Wilhelm Michalak, Niederbiel, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Filed Nov. 3, 1972, Ser. No. 303,514

Claims priority, application Germany, Nov. 25, 1971, 2158428

Int. Cl. F41g 1/44

U.S. Cl. 33—240 **9 Claims**



1. A sighting device for an artillery weapon which is adjustable about an elevation axis with respect to a support base, comprising:

a. a support means attachable to said support base for rotatably mounting a shaft (**201**) in parallel alignment with said elevation axis and means rotatably coupling said shaft to said weapon in such a manner that said shaft rotates in concert with rotations of said weapon about said elevation axis;

b. a universal joint having a first part (**206**) rigidly carried by the shaft;

c. a housing (**200**) for receiving the universal joint, the housing comprising a body portion and a head which is rotatable relative to the body portion and which is connected to the universal joint, the housing being provided with leveling means to permit the housing so to be leveled with respect to said shaft such that the axis of said rotation extends in a vertical direction;

d. a second part (**207**) of the universal joint being mounted on the first part to be rotatable relative thereto about a first joint axis perpendicular to the longitudinal axis of the shaft, said second part defining a second joint axis perpendicular to said first joint axis, and being mounted on a mounting portion (**214**) of said head to be rotatable about said second joint axis; and

e. an angle measuring device comprising a first element (**217**) carried by the second part to be situated within the universal joint and to extend transversely of said second joint axis of the second part, and a second element (**218**) which is rotatable relative to the first element and which is rigidly connected to the mounting portion (**214**), the first and second elements being provided with an arcuate indicating means having its center of curvature on the second joint axis of the second part, the two elements and said indicating means indicating the angle of elevation of means on the head for mounting a telescope, and a further angle indicating means to indicate the azimuth angle of the telescope.

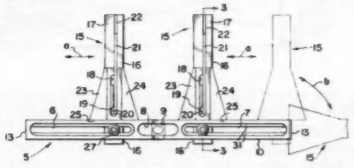
3,851,401
FLANGED PIPE ALIGNING TOOL

Timothy C. Dearman, 4191 E. Stanley Rd., Mt. Morris, Mich. 48458

Filed Aug. 25, 1971, Ser. No. 174,857

Int. Cl. G01c 9/24

U.S. Cl. 33—371 **11 Claims**



1. A tool for use in aligning a flanged pipe or the like having at least a pair of openings in its flange, said tool comprising an elongate body having opposite terminal ends; a pair of probes each of which terminates at one end in a finger of such size as to be accommodated in an opening of such flange; means mounting each of said probes on said body for rotary movements relative thereto and for sliding movements toward and away from a terminal end of said body; and guide means on each of said probes engaging said body except when said probes are at the terminal ends of said body for maintaining said probes selectively in a first position in which said probes extend substantially parallel to said body or in a second position in which said probes substantially parallel each other and extend substantially normal to said body, the engagement of said guide means with said body preventing rotary movement of said probes from either of said positions to the other except when said probes are at the terminal ends of said body.

3,851,402
VAPOR CHAMBER FOR DRYING

James O'Hara Turnbull; William Lipscomb Merritt, both of Cowansville, Quebec, and Ivan Patrick McLaughlin, Sutton, Quebec, all of Canada, assignors to J. J. Barker Company Limited, Quebec, Canada

Filed Oct. 15, 1973, Ser. No. 406,626

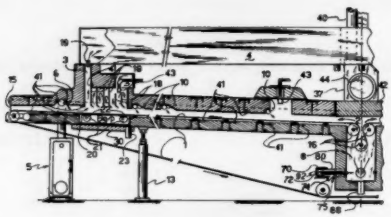
Claims priority, application Canada, Nov. 29, 1972, 157802

Int. Cl. F26b 19/00

U.S. Cl. 34—47 **5 Claims**

1. An apparatus for fast curing wet resin coated articles, comprising a mechanical conveyor for continuously conveying the wet coated articles through a curing chamber, means for producing and passing a vaporous accelerator through the curing chamber in contact with the wet coating of the article during the period of its passage through the curing chamber, means for avoiding the escape of the vaporous accelerator to the atmosphere, means for controlling the temperature and density of the vaporous accelerator within the curing chamber, said means for producing the vaporous catalyst comprising an automatic vapor generator connected to a source of inert carrier gas under low pressure and installed between a supply of liquid catalyst and a mixing chamber incorporated

with the curing chamber, the means for conveying or directing the vaporous catalyst-carrier mix to the curing chamber comprising fans located in supply chambers at each end of the mixing chamber, drawing from the mixing chamber and exhausting into supply chambers which are connected to manifolds located in the side walls of curing chamber which are connected to each end of transverse perforated diffuser tubes located above the conveyor which spray the catalyst carrier gas mix throughout the curing chamber and thus into contact with all exposed surfaces of the wet coated material, the means for providing and maintaining the required density of the vaporous catalyst carrier gas mix comprising a control for



the heat supply to the vapor generator heating liquid associated with the liquid catalyst feed or supply control, the means for producing and maintaining the required temperature of the catalyst vapor carrier mix in the curing chamber comprising thermostatically controlled heat tapes located in the roof, floor and walls of the curing chamber as well as in the entrance and exit to such chamber, the means for minimizing the loss of catalyst comprising air curtains located between the ends of the curing chamber and the entrance and exit portals for the carrier, and the means for avoiding atmospheric pollution comprising means to release a suitable neutralizing agent into the exhaust plenum.

3,851,403

APPARATUS FOR CONDITIONING SHEETS OF PHOTOSENSITIVE MATERIALS

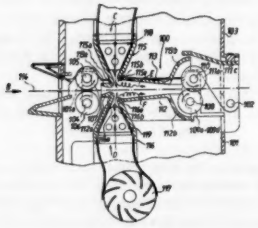
Guenther Maurischat, and Juergen Mueller, both of Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 13, 1973, Ser. No. 350,829

Claims priority, application Germany, Apr. 19, 1972, 2219109

Int. Cl. F26b *13/02*

U.S. Cl. 34—48 **8 Claims**



1. In an apparatus for conditioning sheet-like commodities, particularly for drying sheets or webs of photosensitive material, a combination comprising a conditioning chamber having an inlet end and a discharge end; conveyor means for transporting sheet-like commodities along an elongated path extending through said chamber so that successive commodities respectively enter and leave said chamber by way of said inlet end and said discharge end; at least one source of conditioning fluid; at least one nozzle connected with said source and having an elongated orifice extending substantially transversely of said path and arranged to discharge conditioning fluid against one side of a commodity in said path, said nozzle having an elongated passage for the flow of fluid from said source toward said path, said passage having portions of different width and said orifice constituting the narrowest portion of said passage; and control means for regulating the temperature of conditioning fluid, comprising a temperature measuring device arranged to produce signals indicating the temperature of conditioning fluid in said orifice and including elongated temperature monitoring means installed in and extending lengthwise of said orifice, across the full width of a commodity in said path, and across the stream of conditioning fluid passing through said orifice so that said monitoring means is influenced by and indicates the average temperature of the entire stream of conditioning fluid, the transverse dimensions of said elongated monitoring means constituting a small fraction of the width of said orifice, adjustable heating means for conditioning the fluid, and means for adjusting said heating means in response to said signals so that the conditioning action of said heating means upon the fluid is a function of the average temperature of fluid in said orifice as detected by said monitoring means.

3,851,404

APPARATUS FOR DRYING PARTICULATE MATTER WITH GASEOUS MEDIA

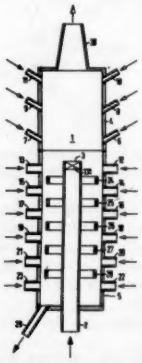
Aribert Fracke; Heinrich Klein; Rudolf Pieper, all of Erlangen; Eduard Weber, Nurnberg, and Hans Wachtler, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 817,628, April 18, 1969, abandoned, which is a continuation of Ser. No. 621,333, March 7, 1967, abandoned. This application Mar. 22, 1971, Ser. No. 126,870

Claims priority, application Germany, Mar. 10, 1966, 102434; Mar. 12, 1966, 102490; Jan. 20, 1967, 107918

Int. Cl. F26b *13/20*

U.S. Cl. 34—56 **2 Claims**



1. Apparatus for drying particulate matter with gaseous media, comprising a vessel having a rotationally symmetrical vortex chamber with a substantially vertical axis wherein a combined gas flow composed of a potential flow and a rotational flow is to be produced, said chamber including a central gas inlet duct protruding coaxially into said chamber and forming therewith a lower annular chamber portion and an upper chamber portion communicating with said lower chamber portion, said duct having an opening facing toward said upper chamber portion for introducing a particle laden gas stream into said upper chamber portion, said upper chamber

portion having a centrally located gas outlet, lateral gas injection inlets communiclating with said upper chamber portion and axially spaced from the opening of said duct, said inlets having a direction tangential to said chamber and inclined toward said duct opening, and a plurality of further inlet means tangentially communicating with said annular interspace of said lower chamber portion, said plurality of further inlet means being peripherally distributed and arranged in pairs respectively in several spaced tiers axially spaced along said duct for supplying gaseous medium at the respective tiers to cause accumulation of said particle material in the form of freely floating rings coaxially around said duct and respectively between adjacent spaced tiers, said plurality of further inlet means respectively defining a flow path disposed in a plane extending at a right angle to the axis of said duct and vessel.

3,851,405

FLUIDIZING DEVICE

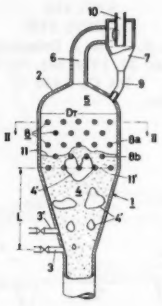
Kenji Furukawa, Tokyo; Hirofuji Uyama, Yokohama; Takashi Tsuchiya, Shin-Nanyo; Chikashi Kido, Iwakuni, and Keiichi Torii, Yokohama, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 30, 1973, Ser. No. 346,323

Claims priority, application Japan, May 11, 1972, 47-45882

Int. Cl. F26b *17/10*

U.S. Cl. 34—57 A **5 Claims**



1. In a fluidizing device incorporating a free board section of a fluidized bed, an improvement which comprises in combination a plurality of internal members each having a horizontal width of between 0.1 and 0.01 times the height of the fluidized bed and disposed in the free board section formed above the fluidized bed so that the interval between each internal member and the nearest neighboring internal member falls in the range of 0.05 to 0.3 times the height of the said fluidized bed and the projected area ratio of all the internal members to the area of the cross section of the free board section is not smaller than 0.5.

3,851,406

FLUIDIZED-BED APPARATUS

Ion D. Dumitru; Victor A. Grigoras; Mircea Ioan T. Turtureanu; Doina Ecaterina G. Stanciu, and Vasile V. Anescu, all of Bucharest, Romania, assignors to Ipran-Institutul de Proiectari Pentru Industria Chimica Anorganica Si A Ingrasamintelor, Bucharest, Romania

Filed Apr. 23, 1973, Ser. No. 353,772

Claims priority, application Romania, Apr. 24, 1972, 70664

Int. Cl. F26b *17/10*

U.S. Cl. 34—57 R **3 Claims**

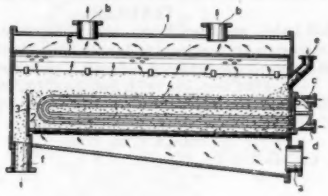
1. An apparatus for the treatment of a powder comprising:

housing means defining a fluidized bed chamber elongated horizontally and formed at one end with an inlet for the material to be processed and at the opposite end with an outlet for powder whereby said material traverses said chamber generally horizontally;

means forming a fluidizing-gas space below said chamber;

a perforated sheet communication in between said space and the bottom of said chamber for admitting fluidizing gas to said chamber to fluidize a bed of said material therein, said chamber having a free space above said bed;

at least one filter sheet of fibrous material clinging to said perforated sheet and controlling the flow of fluidizing gas through said perforated sheet into said chamber, said chamber having a pair of lateral walls extending in the longitudinal direction.



a downwardly concave vaulted perforated plate in said open space above said bed, said perforated plate permitting the discharge of gas from said chamber and having longitudinal edges spaced from said lateral walls whereby particles deposited upon the upper surface of said perforated plate fall between said edges and said lateral walls into said fluidized bed;

a plurality of tubular heat-transfer elements having mutually parallel spaced apart stretches extending longitudinally into said chamber from at least one end thereof within said bed, said elements being spaced across the entire cross section of said bed in a plurality of horizontal rows offset from one row to another; and

means for feeding a heat transfer fluid to and removing heat transfer fluid from said elements.

3,851,407

DRYING APPARATUS FOR A WRINKLED PAPER WEB

Pekka Paivio Rantala, Briarcliff Manor, N.Y., assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Oct. 20, 1970, Ser. No. 82,329

Int. Cl. F26b *13/00*

U.S. Cl. 34—155 **1 Claim**

1. In a paper machine, a drying apparatus for a paper web which has been wrinkled in a damp condition, comprising:

a base;

a frame on the base;

rollers rotatably mounted on the frame;

at least one moving endless wire guided by the rollers for supporting the wrinkled paper web; and

means attached to the frame for blowing a hot gaseous medium on the wrinkled paper web on the wire in order to dry and press the web against the wire so that the wrinkles of the paper web are retained during the drying operation, at least one of the wire guiding rollers having perforations and an outlet connected to its inside to remove humid air from the inside of the wire loop.

3,851,408

DEVICE FOR THE CONTINUOUS DRYING AND FINISHING OF WEB MATERIALS, PARTICULARLY TEXTILES

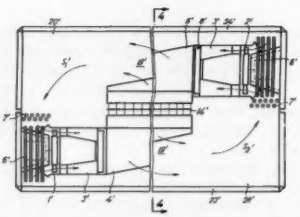
Rudolf Lojek, and Josef Ryska, both of Frydlant v. Cechach, Czechoslovakia, assignors to Zavody Elitex Textilniko Strojirenstvi generalni reditestvi, Liberec, Czechoslovakia

Filed Dec. 21, 1971, Ser. No. 210,320

Claims priority, application Czechoslovakia, Dec. 21, 1970, 8637-70

Int. Cl. F26b *13/06*

U.S. Cl. 34—155 **5 Claims**



1. A device for drying webs of textile materials, comprising a housing forming a closed chamber, means in the chamber for supporting a web to be dried as the web travels horizontally within the chamber, nozzle cases inside the chamber mounted along its whole width both above and below the horizontal path of the web to be dried, said nozzle cases blowing a drying medium at the web, and axial flow fans with heaters, said fans being arranged with their axes horizontal, in pairs directed oppositely to each other, and on opposite sides and spaced from the vertical central plane of the horizontal web path, one of said two fans being mounted below the horizontal web path, the other said fans being mounted above said horizontal web path, the nozzle cases having delivery nozzles, the fans having feeding apertures, and the delivery nozzles of each of said nozzle cases being connected to the feeding aperture of the fan of the other nozzle case, each pair of fans and nozzle cases forming parts of a closed drying medium circuit in which the two fans are connected in series, whereby the drying medium flow consists entirely of recirculated drying medium.

3,851,409

MATHEMATICAL EDUCATIONAL DEVICE

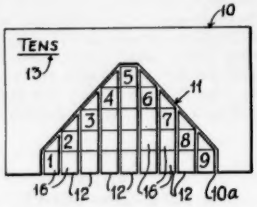
Teresa C. Teahan, 304 N.W. 26th St., Gaineville, Fla. 32607

Substitute for Ser. No. 271,142, July 12, 1972, abandoned. This application Mar. 20, 1974, Ser. No. 452,686

Int. Cl. G09b *19/02*

U.S. Cl. 35—31 F **5 Claims**

1. A mathematical educational device comprising at least two playing boards, each of said boards having an isoscles triangular cut-out therein with the apex of said triangular cut-out lying within the body of said board and the base thereof open and co-extensive with one edge of said board; nine removable pegs for each of said boards, the mid peg thereof being square edged at both ends and each of said remaining pegs being bias cut at one end and square edged at the other end such that when said pegs are assembled in a side-by-side relationship, they collectively fit within and form the same shape as said triangular cut-outs, said pegs being successively numbered from 1 to 9, inclusive, with those pegs bearing numbers 1 to 4 being respectively mirror images of



those pegs bearing numbers 6 to 9, inclusive; and, means for assigning a numerical value to the pegs in each of said boards, said value being based on multiples of ten, including unity, and the value assigned to successive playing boards being no greater than one multiple of ten.

3,851,410

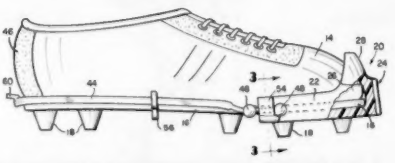
KICKING TOE

Garland D. Frazier, R. R. No. 2, Poland, Ind. 47868

Filed Mar. 21, 1974, Ser. No. 453,214

Int. Cl. A43b

U.S. Cl. 36—2.5 AG **8 Claims**



1. A football kicking toe for mounting on and removal from a shoe, comprising a front portion having a ball-engaging face, a pair of arms extending rearwardly from said front portion along the shoe sides and having grooves for receiving the edge of the shoe-sole, said front portion and arms forming a flange underlying the shoe-sole for a substantial distance inwardly from the edge thereof, an elastic strap connected to said arms and extending along the shoe sides and behind the heel above the shoe-sole, and an elastic yoke slidably connected to said strap intermediate the shoe length to urge said strap inwardly against the shoe sides for substantially the entire shoe length.

3,851,411

FOOTWEAR EMBODYING FABRICLESS THERMOPLASTIC COUNTER

Richard B. Crosbie, Woodbury, and Thomas A. Byra, Waterbury, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

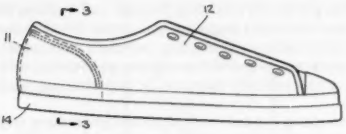
Filed Nov. 19, 1973, Ser. No. 417,320

Int. Cl. A43b *13/42*

U.S. Cl. 36—68 **5 Claims**

1. Footwear having a counter embodied in the heel portion of the upper, the said counter being a homogeneous thermoplastic fabricless counter made of a blend of (a) a monoolefin

copolymer rubber and (b) a polyolefin plastic, in weight ratio of from 10/90 to 90/10, said counter providing stiffness at the



heel and supplying frictional engagement with the heel of the wearer to help maintain the shoe in place on the foot.

3,851,412

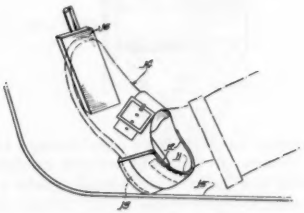
HEEL PROTECTOR COVER

George A. Voegele, and Cecelia B. Voegele, both of Rt. 3, Box 305, Faribault, Minn. 55021

Filed Jan. 14, 1974, Ser. No. 432,821

Int. Cl. A43b *13/22*

U.S. Cl. 36—72 B **4 Claims**



1. A protector cover device adapted for use with an individual's shoe to protect the back and sides of the shoe heel portion thereof against marring and scuffing when the shoe must rest on such back portion when being used to operate an accelerator pedal of a vehicle, the protector comprising a flexible shell having a substantially U-shaped cross-section with vertical front edges and a curved back bight forward surface and which is shaped to conform to the shape of the heel and shoe back portion of an individual's shoe and adapted to pass around the back and side portions thereof to provide a protective cover thereover, a recess compartment defined in a bottom surface thereof having surrounding rigid vertical wall surfaces to receive the heel of the shoe completely therein so as to completely enclose the bottom and sides and back surface of the shoe heel, the bight portion of the protector adapted to engage the back portion of the shoe, the leg portions of the protector adapted to pass about the back side surfaces of the shoe, and a spring steel band of a generally U-shaped configuration affixed to the interior surface of said shell adjacent the top edge thereof and affixed to said bight and said leg portions thereof parallel to the shell bottom surface, said band resiliently urging the front edges of said side portions slightly inwardly toward each other whereby insertion of the back portion of an individual's shoe therebetween with the shoe heel inserted into the recess compartment will effect the spreading of said side portions to frictionally engage said side portions with said shoe and thus temporarily attach said protector to said shoe.

3,851,413

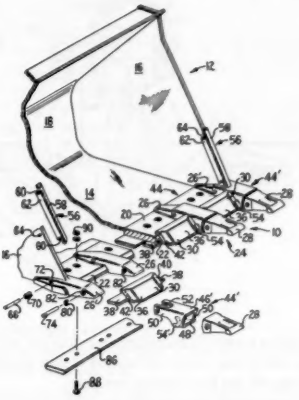
QUICK CHANGE CUTTING EDGE

Paul James Lukavich, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 174,004, Aug. 23, 1971, abandoned. This application Sept. 14, 1973, Ser. No. 397,102

Int. Cl. E02f *9/28*

U.S. Cl. 37—141 T **17 Claims**



1. In a material carrying receptacle of the kind which is driven into material to be loaded and which has a forward facing opening requiring a cutting edge, a replaceable cutting element construction comprising:

a cutting edge support integral with the material carrying receptacle,

a plurality of teeth secured to the cutting edge support in laterally spaced relationship,

a plurality of cutting edge sections mounted on said cutting edge support between the teeth,

wearable protector means having a lower surface positioned on said support behind said teeth removably secured on each of the teeth with the protector means engaging with and retaining the cutting edge section on said support, and

a lower wear surface comprising an extension of said cutting edge section and extending behind the lower surface of said protector means and forming a substantially planar wear surface with the lower surface of said protector means, the lower wear surface of said cutting edge sections extending substantially across said receptacle.

3,851,414

CONTINUOUS IRONING AND PRESSING MACHINE FOR FLAT MATERIALS

Zdenek Miculka, Otrokovice; Vladislav Janirek, Gottwaldov; Vladimir Rektorik, Otrokovice, and Josef Hanacek, Hylin, all of Czechoslovakia, assignors to Strojosvit, narodi podnik, Krnov, Czechoslovakia

Filed Nov. 2, 1973, Ser. No. 412,462

Claims priority, application Czechoslovakia, Nov. 3, 1972, 7410-72

Int. Cl. D06f *61/08*

U.S. Cl. 38—49 **7 Claims**

1. In a machine for the continuous ironing and pressing of flat material including an ironing cylinder cooperable with a pressing cylinder to apply pressure to an endless, material-conveying belt advanced between the ironing and pressing cylinders, an improved construction for the machine which comprises:

a top frame; a bottom frame including a pair of axially spaced blocks that define a channel therebetween for receiving the endless belt;

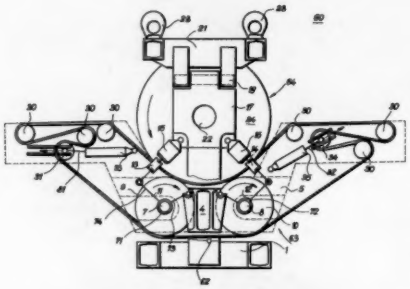
first and second hangers removably suspended from axially spaced regions of the top frame for rotatably supporting opposite ends of the ironing cylinder;

an elongated carrier member affixed to the bottom frame in engagement with the blocks, the carrier member and the bottom frame defining a bottom frame assembly; a bearing for rotatably receiving an end of the pressing cylinder; a two-armed lever connected to the bearing, one of the arms of the lever being movable;

first means for coupling the movable arm of the lever to the first hanger;

second means for coupling the other arm of the lever to the carrier member; and

means for removably securing the first hanger to the bottom frame assembly.



3,851,415

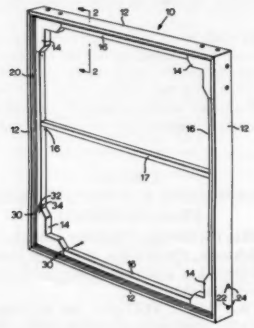
PICTURE FRAME

Johannes Vihma, Toronto, Ontario, Canada, assignor to Artistic Woodwork Co. Ltd., Ontario, Canada

Filed Aug. 1, 1973, Ser. No. 384,457

Int. Cl. G09f *1/12*

U.S. Cl. 40—152 **10 Claims**



1. A picture frame comprising,

a. a plurality of plastic frame molding members disposed in an end to end abutting relationship to define the sides of said frame, said plastic frame molding members having a thickness in the range of 0.125 inches to 0.50 inches,

b. lip means projecting inwardly from said inwardly directed surface of each molding member for supporting a picture thereon,

c. corner blocking means at each corner of said frame spaced rearwardly from said lip means to secure a picture therebetween, said corner blocking means having a pair of outer support surfaces disposed at right angles to one another,

d. locking pin means extending through said molding members and releasably engaging said corner block means to releasably secure said molding members with respect to said block means and with respect to one another with the ends of the molding members in said abutting relationship,

e. said blocking means being rigid and preventing angular deflection of abutting plastic frame molding members.

3,851,416

DEVICE FOR CARTRIDGE CHAMBER IN CARTRIDGE TOOL

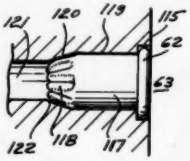
Per Ingemar Engstrom, Vastervis, and Erhard Rudolf Boye, Gunnebobruk, both of Sweden, assignors to Gunnebo Bruks Aktiebolag, Gunnebobruk, Sweden

Filed Feb. 2, 1973, Ser. No. 328,922

Claims priority, application Sweden, Jan. 3, 1973, 515/73

Int. Cl. F41c *3/00*; B25c *1/14*

U.S. Cl. 42—1 R **2 Claims**



1. In a cartridge tool including a barrel having a bore and a cartridge chamber for receiving crimped cartridges and communicating with the bore which axially guides a striker piston, the improvement comprising the cartridge chamber having three sections, a first cylindrical section for accommodating a cartridge, a second cylindrical section communicating with the bore, said second cylindrical section having a smaller diameter than said first cylindrical section and being displaced therefrom, and a third section connecting said first and second sections, said third section having a diameter which gradually decreases and having a length which is shorter than the length of the crimped portion of the crimped cartridge so that such crimped portion extends into said second section when the crimped cartridge is completely inserted in the chamber and the border of said second and third sections providing a breaking edge when the cartridge is fired whereby the part of the crimped portion forward of the breaking edge presses against said second cylindrical section and the remainer pivots away from the wall of said third section.

3,851,417

COCKROACH TRAP

Anton E. Wunsche, 656 W. 162nd St., New York, N.Y. 10032

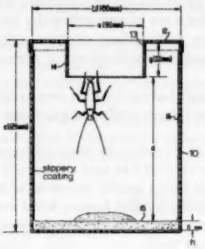
Continuation-in-part of Ser. No. 330,671, Feb. 8, 1973, and a continuation-in-part of Ser. No. 153,709, June 16, 1971, abandoned. This application Dec. 5, 1973, Ser. No. 422,105

Int. Cl. A01m *1/00*

U.S. Cl. 43—121 **10 Claims**

1. A trap for crawling insects, comprising an upright container with a closed bottom adapted to hold a supply of bait and with a top having an aperture spaced from the rim thereof, said top being provided with a downward extension adjoining said aperture and forming a guidepath leading toward said supply of bait but terminating sufficiently short of said bottom to prevent an insect attracted by the bait from regaining said

extension after landing on said bottom, and a slippery coating on the inner peripheral wall of said container for frustrating



attempts of the insect to climb said wall, said coating comprising a mixture of lanolin and linseed oil.

3,851,418

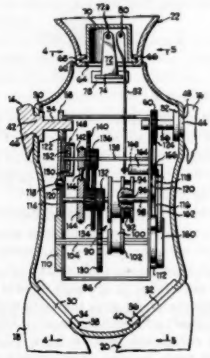
ANIMATED DOLL

Gordon A. Barlow, Skokie, and Marvin I. Glass, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 7, 1973, Ser. No. 330,313

Int. Cl. A63h *11/00*

U.S. Cl. 46—120 **6 Claims**



1. An animated doll, comprising:

a torso having a shoulder joint at each side;

a head mounted on top of said torso;

a first arm and a second arm rotatably mounted on said torso at said shoulder joints for pivoting relative to said torso at said shoulder joints about a transverse, side-to-side axis between lowered positions and raised positions; a blanket attached between outer ends of said arms for movement therewith to simulate the movements of a child playing peek-a-boo; and

motive means within said torso, including programming means, operatively connected to said arms to move said arms and said blanket therewith in a given sequence between a first position whereat both arms are in their lowered positions, a second position whereat both arms are in their raised positions, and a third position whereat the first arm is in a raised position and the second arm is in a lowered position.

3,851,419

REVERSIBLE DOLL

Bette M. Kaelin, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 6, 1973, Ser. No. 386,157

Int. Cl. A63h *3/12*

U.S. Cl. 46—153 **9 Claims**

1. A reversible doll comprising:

a head having two back-to-back faces with different features formed thereon; and

clothes means formed of material having two sides with a different design on each side, said clothes means including a top hood portion having an opening secured to said head so as to divide the head generally along a vertical plane when the head is erect and separating the two faces so that one of the faces is in the interior of the hood portion while the other face is exposed through said hood opening, whereby the doll can be transformed by turning the clothes means inside out with respect to said head so that the previously exposed face will be covered by the hood portion.

3,851,420

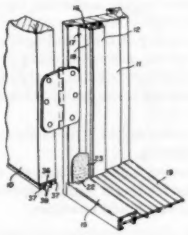
DOOR AND THRESHHOLD WEATHERSEAL SYSTEM

Philip E. Tibbetts, Rochester, N.Y., assignor to The Schlegel Manufacturing Company, Rochester, N.Y.

Filed Jan. 26, 1973, Ser. No. 326,977

Int. Cl. E06b *1/70, 7/16*

U.S. Cl. 49—471 **16 Claims**



1. A door and threshold weatherseal system having weatherseal means along a vertical edge of said door for conducting water downward along said edge of said door and comprising:

a. said threshold being formed as a single piece extrusion having a sill sloping downward and outward from said door, the inner edge of said threshold extending above said sill to form a generally closed chamber formed above said sill and arranged under said door with the bottom of said chamber communicating with the top of said sill;

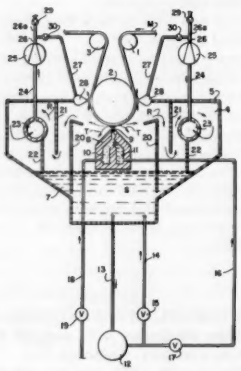
b. means above said sill for closing the ends of said chamber adjacent the frame of said door;
c. said chamber having a top opening on the opposite side of said end closing means from said frame;
d. means for guiding water from the bottom of said edge weatherseal means into said top opening of said chamber;
e. said chamber having a drain opening leading from the bottom of said chamber to empty onto said sill; and
f. said top of said chamber being about ½ inch or more above the top of said drain opening so wind pressure against said drain opening opposes a head of water within said chamber beneath said door.

3,851,421

APPARATUS FOR GRAINING SURFACES OF PLANOGRAPHIC PRINTING PLATES

Joachim Stroszynski, Neurod, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

Division of Ser. No. 97,945, Dec. 14, 1970, abandoned. This application Apr. 12, 1973, Ser. No. 350,596
Claims priority, application Germany, Dec. 15, 1969, 1962729
Int. Cl. B24c *3/12*
U.S. Cl. 51—11 **2 Claims**



1. An apparatus for graining the surface of a strip of sheet material useful for making planographic printing plates comprising die means having a slot like opening therein and gas and liquid chambers converging at one of their longitudinal sides to form a mixing channel ending at said slot-like opening, whirling niche means extending along one of the sidewalls of said mixing channel, the distance between said slot-like opening and said whirling niche being at least as long as said slot-like opening is wide,
means for conveying the strip of sheet material across said slot-like opening,
means for feeding a gas into said gas chamber,
and means for feeding a liquid suspension of solid graining means into said liquid chamber.

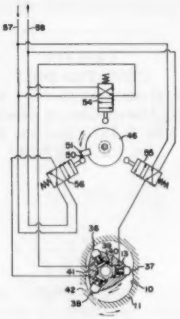
3,851,422

HONING MACHINE FOR FINISHING TROCHOIDAL BORE OF ROTOR HOUSING OF ROTARY ENGINE

Satoshi Dojyo, and Tsutomu Yoshino, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima-ken, Japan

Filed Dec. 27, 1972, Ser. No. 319,000
Int. Cl. E24b *19/08*
U.S. Cl. 51—34 J **6 Claims**

1. A honing machine for finishing a trochoidal bore of a workpiece by honing the inner wall surface thereof, comprising:
a relatively stationary main body;
a drive shaft rotatably born on said main body and provided with two integral gears;
a honing head provided on its periphery with a plurality of stone slips which are biased outwardly into sliding contact with the inner wall surface of the workpiece for honing the same when rotatably received within the trochoidal bore;
a cylindrical shaft having its axis arranged in parallel with the axis of said drive shaft and provided with an integral gear;
a honing-head shaft coaxially secured to said honing head and coaxially received in said cylindrical shaft, said honing-head shaft being axially movable within said cylindrical shaft for bringing said honing head into and out of the trochoidal bore but being forced to rotate integrally with said cylindrical shaft;



a first intermediate idle gear meshing with one of the gears of said drive shaft and with the gear of said cylindrical shaft for transmitting rotational motion from said drive shaft to said honing head by way of said cylindrical shaft and honing-head shaft;
a machine table for holding the workpiece in position;
a table shaft coaxially secured to said machine table and provided with an integral gear, said table shaft having its axis arranged eccentrically of the axis of said honing-head shaft but in parallel with the axis of said drive shaft;
a second intermediate idle gear meshing with the other gear of said drive shaft and with the gear of said table shaft for transmitting rotational motion from said drive shaft to said machine table by way of said table shaft, the direction of rotation of said honing head being the same as that of said machine table, and the ratio of speed of rotation of the former to that of the latter being predetermined, so that the former moves relative to the latter in a manner to draw a preset trochoidal curve; and
eccentricity control means for finely controlling eccentricity between the axes of said honing head shaft and table shaft.

3,851,423

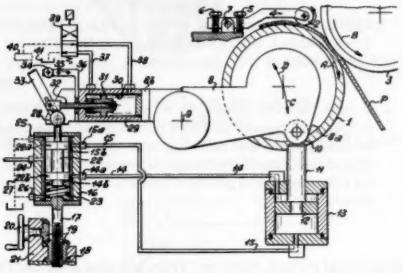
SKIN DRESSING MACHINE

Silvio Repetto, Modena, Italy, assignor to S. p. A. Luigi Rizzi & C., Modena, Italy

Filed May 11, 1973, Ser. No. 359,276
Claims priority, application Italy, May 27, 1972, 24968/72
Int. Cl. B24b *7/00, 49/08*
U.S. Cl. 51—78 **5 Claims**

1. A machine for buffing skins, which comprises, in combination:

1. a driven skin conveying roller,
2. a retaining roller defining a nip with the conveying roller, the skin being conveyed through the nip,
3. a skin buffing roller defining an adjustable nip with the conveying roller, the skin being buffed in the adjustable nip by the buffing roller,
4. a rocker lever having two arms and mounted for pivotal movement,
   a. one of the rocker lever arms supporting the conveying roller for adjusting the nip between the conveying roller and the buffing roller upon pivotal movement of the lever,
5. a hydraulically operated thrust means arranged in contact with the one rocker lever arm for effectuating the pivotal movement thereof to provide a basic nip adjustment,



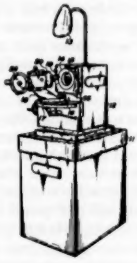
6. a source of hydraulic pressure fluid and a hydraulic supply conduit means connected to the thrust means for operating the thrust means and providing the basic nip adjustment, and
7. a first valve in the hydraulic supply conduit means for controlling the supply of hydraulic pressure fluid to the thrust means, the first valve including
   a. a sliding member operatively associated with the other rocker lever arm and axially moved thereby upon pivotal movement of the lever in correspondence to the corresponding nip adjustment, the axial movement of the sliding valve member controlling the hydraulic pressure fluid supply to the thrust means to restore the skin conveying roller to the basic nip adjustment.

3,851,424

APPARATUS FOR RE-SHARPENING THE CUTTING EDGES OF A DRILL

Hiroshi Kawaragi, 10-9 Oomorinishi 1-chome, Tokyo, Japan

Filed Oct. 6, 1972, Ser. No. 295,472
Int. Cl. B24b 3/26
U.S. Cl. 51—133 **3 Claims**



1. An apparatus for re-sharpening the cutting edges of a drill, including;
   a housing having a cup-shaped grinding wheel mounted thereon so as to be either moved forwardly by a driving mechanism in said housing or rotated in a predetermined direction by said driving mechanism;
   a drill holding and actuating body having a drill supporting sleeve extending axially therethrough, said sleeve being designed to support a drill in such a manner that the axis of said drill is so inclined with respect to the grinding surface of said grinding wheel that the surfaces of the cutting edges of said drill are in grinding contact with said grinding surface;
   an actuation wheel the rotation of which is transmitted through an intermediate gear wheel to a spur gear on the rear portion of said drill holding and actuating body, said intermediate gear being in meshing engagement with said spur gear;
   a gear train comprising an internal gear on a covering sleeve mounted on the forward portion of said drill holding and actuating body, a two-diameter gear wheel in meshing engagement with said internal gear, and a planetary gear in meshing engagement with said two-diameter gear and with an external gear on the outer peripheral surface of the forward portion of said body;
   a guide ring mounted on said body substantially at an axially central portion thereof, said guide ring being pivotally connected by pins on the inner peripheral surface of an outer sleeve and having a cam surface formed on a side face of said ring at a circumferential portion thereof;
   a knob having a shaft extending radially inwardly therefrom, said shaft having an eccentric shaft mounted on the inner end of said shaft and being in sliding engagement with the top portion of said guide ring so that the rotation of said knob causes a pivotal motion of said guide ring; and
   means for axially moving said drill holding and actuating body, said means comprising an actuation ring on the peripheral outer surface of said body having a roll in rolling contact with a side face of said guide ring and a ball mounted on the outer periphery of said body and urged by a spring against the other side face of said guide ring.

3,851,425

JIG APPARATUS FOR USE IN STRIPPING INSULATION FROM FLAT MULTI-CONDUCTOR CABLE

Roger J. Lang, Garden Grove, Calif., assignor to Spectra-Strip Corporation, Garden Grove, Calif.

Filed Jan. 24, 1973, Ser. No. 326,285
Int. Cl. H02g 1/12
U.S. Cl. 51—217 **10 Claims**

1. In a jig apparatus, adapted for stripping insulation from insulated multi-conductor cable by means of rotatable, spaced-apart vertically-in-line stripping wheels, the improvement which comprises:
   a jig plate longitudinally movable, in a given direction, with respect to said stripping wheels;
   an elongated slot provided in said jig plate within which said stripping wheels can rotate as said jig plate is moved;
   channel means formed on either side of said slot, said channel means aligning said cable whose insulation is to be stripped with respect to a given reference line; and

means for releasably clamping said cable in said channel means so that said cable is held flat in said slot as said stripping wheels are passed through said slot and strip insulation from said cable, and which clamping means are releasable after said stripping of insulation has been completed.

3,851,426

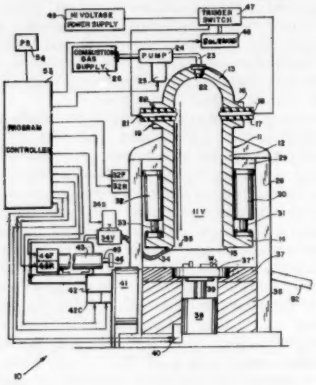
METHOD FOR FINISHING ARTICLES

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 93,779, Nov. 30, 1970, Continuation-in-part of Ser. No. 668,567, June 27, 1957, abandoned. This application Mar. 27, 1972, Ser. No. 238,362

Int. Cl. B24c *1/00*

U.S. Cl. 51—319 **13 Claims**



1. A method for operating on and physically changing work-in-process comprising:

disposing an article to be physically worked in a confined reaction chamber,

generating a shock wave within said chamber of such an intensity to heat and apply sufficient force to the article to physically change the shape of the article located within said chamber, and

directing said shock wave against said article in a manner to cause said shock wave to react on the surface of said article so as to change the shape of said article and to alter the surface configuration thereof without destroying the integrity of the article whereby the article is surface finished.

3,851,427

STRUCTURAL SYSTEM EMPLOYING EIGHT-SIDED POLYGONAL UNITS CONSTRUCTED OF PREFABRICATED ELEMENTS

Emile Joseph Lacoste, III, Lacoste Ln., Oxford, Miss. 38655

Filed June 12, 1973, Ser. No. 369,239

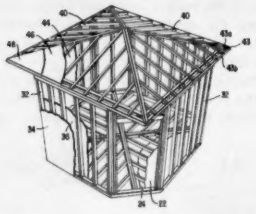
Int. Cl. E04b *1/348*

U.S. Cl. 52—79 **18 Claims**

1. A structural system having at least one story comprising: two or more modular-type units arranged adjacent each other, each of said units having:

a. a floor member consisting of four pentagonal-shaped floor panels arranged in the shape of an eight-sided polygon,

b. a wall member consisting of a first and second set of four rectangular-shaped, interconnected, wall panels each, said four panels of said first set being equal in size to each other and smaller than said four panels of said second set, at least one of said wall panels of said second set being a common interior wall panel between adjacent units, said wall panels of said second set being vertically positioned and secured to the periphery of said floor member so as to provide an area beneath said wall panels of said second set for receiving a portion of a pentagonal shaped floor panel of said adjacent unit in load bearing relationship to said wall panels of said second set, and



c. a roof member consisting of a plurality of triangular-shaped roof panels, said roof panels being positioned and secured to said wall member such that a portion of each of said roof panels overhangs said wall panels of said first set when any of the panels of said first set are exterior wall panels.

3,851,428

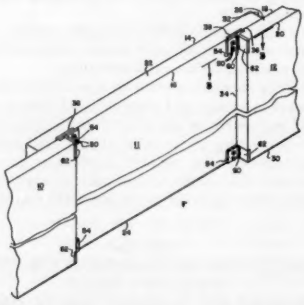
BUILDING PANEL CONNECTION MEANS AND METHOD

Barry L. Shuart, 3739-W. Ocotillo Rd., Phoenix, Ariz. 85019

Filed Jan. 19, 1973, Ser. No. 325,188

Int. Cl. E04b *2/88*

U.S. Cl. 52—285 **5 Claims**



1. In a building panel connection means, the combination of: first and second substantially vertical wall panels each having inner and outer sides, vertical edges and lower portions, and also holding adjacent substantially vertical edges overlapped relative to each other such that an inner side of said first wall panel is substantially contiguous with the outer side of said second wall panel between said overlapped edges; a first connector plate disposed at said inner side of said first wall panel in a location to coincide with said vertical edge of said second wall panel; said first connector plate having first anchor means cast in said first wall panel; a second connector plate disposed at said vertical edge and outer side of said second wall panel; said second connector plate having second anchor means in said second wall panel; said first and second connector plates disposed to coincide with each other when lower portions of said first and second wall panels are supported on a foundation; bolts secured to (in) said first connector plate and projecting in a direction away from said inner side of said first wall panel; a coupling plate having openings therein larger than the diameter of said bolts and generally coinciding therewith; large washers overlying said openings in

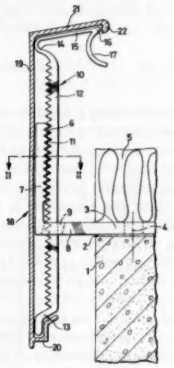
said coupling plate; nuts on said bolts bearing against said washers; and weld structure fixing said coupling plate to said second connector plate whereby said openings in said coupling plate being larger than the diameter of said bolts provide for relative movement of said first and second panels relative to each other due to contraction or expansion in response to varying environmental conditions; said first wall panel having first anchor means spaced from its vertical edge; said first connector plate and said coupling plate extending beyond said vertical edge of said second wall panel, at the inner side of said first wall panel, whereby said openings of said coupling plate may be placed over said bolts before said coupling plate is welded to said second connector plate.

3,851,429

DEVICE FOR ATTACHING A LATERAL CLADDING MOLDING ON THE EDGE OF A ROOF

Horst Franz Zimmer, Johannisstrasse 19, D-5500 Trier, Germany

Filed Jan. 15, 1973, Ser. No. 323,367
Int. Cl. E04f *19/02*
U.S. Cl. 52—94 **9 Claims**



1. An assembly for adjustably securing a molding on the edge of a roof, comprising in combination:

a bracket having a first limb including means adapted to mount the first limb substantially horizontal at a roof edge, said bracket including a second limb integral with and disposed substantially normal to the first limb, said second limb including first teeth on one face thereof;

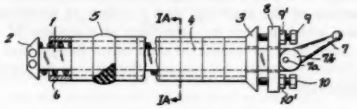
a molding-mount extending in adjustable juxtaposed relationship along the face of said second limb closest to said first limb of the bracket for clamped engagement on said second limb face, said molding-mount including connecting-portions adjacent opposed portions thereof for removably-receiving a molding clamped onto said molding-mount with the second bracket limb sandwiched therebetween; and a molding having mounting-means adjacent opposed portions for engaging the respective connecting portions on said molding mount, said molding being substantially juxtaposed at the face of said second limb opposite that face engaged by the molding-mount and comprising the means for integrating the bracket, molding-mount and molding in an assembled relation, at least one of the molding mount and the molding having second teeth intermeshingly engaged with the first teeth on the second limb for preventing displacement between the assembled components of the assembly, whereby the second bracket limb is clamped in a substantially fixed manner between the confronting faces of the molding-mount and the molding so that the intermeshed first and second teeth are immediately separable after the molding is removed from the molding-mount.

3,851,430

RESILIENT SUPPORTING MEMBER

Wilhelm Schuster, Neubauzeile 57, Linz/Donau, Austria

Filed Mar. 7, 1973, Ser. No. 338,817
Int. Cl. E04h *12/18, 1/343;* **A47b** *83/04*
U.S. Cl. 52—108 **10 Claims**



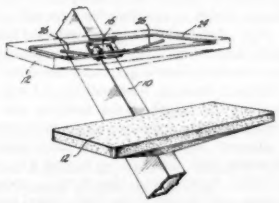
1. In a stress-absorbing structure, in combination, supporting means and an elongate member carried by said supporting means with freedom of deflection in a predetermined direction under transverse stress, said member comprising a throughgoing leaf spring with broad surfaces perpendicular to the direction of stress and reinforcing means adjacent at least one of said surfaces, going into compression upon deflection, for stiffening the deflected leaf spring by resisting further compression of said one of said surfaces beyond a predetermined limit, said reinforcing means comprising a row of abutments axially spaced apart in a normal position of said leaf spring, said abutments including rigid formations rising from said one of said surfaces at axially spaced locations in positive contact with said leaf spring.

3,851,431

CANTILEVER STAIRSTEP CONSTRUCTION

Harold I. Klein, 2215 Killarney Way, Bellevue, Wash. 98004

Filed Apr. 16, 1973, Ser. No. 351,190
Int. Cl. E04f *11/14, 11/16*
U.S. Cl. 52—189 **2 Claims**



1. In a precast concrete stairstep which includes an imbedded metal mounting member which is weldable to an upper portion of a metal stringer, for connecting the stairstep to the stringer, and from which the stairstep projects in cantilever fashion, the improvement comprising:

said metal mounting member being a length of channel stock having a web and two flanges which project from the web forwardly into the concrete, said mounting member also including two rearwardly projecting elements of plate metal which are tabs bent out from said web, leaving an opening in the web inwardly of each tab and channel stock end portions outwardly of said tabs, and resulting in said tabs having inner side surfaces which are perpendicu-

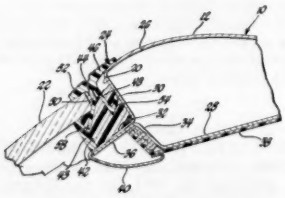
lar to the web, said side surfaces being spaced apart a distance substantially equal to the width of the stringer, to define a space therebetween in which the stringer is received, each said tab presenting edge portions which are weldable to side portions of the stringer, and said web including a plate portion between the openings which rests on the top of the stringer, and said stairstep also includes reinforcement steel which is welded to said channels and projects therefrom into the concrete, said reinforcement steel consisting of a single loop of reinforcement steel which is welded along one side only to the mounting member flange that occupies an upper position on the metal stringer, and which extends over the other flange in a plane that is generally parallel to the upper surface of the stairstep, and a length of reinforcement steel which is bent into the form of a shallow V, and is welded near its middle to such other flange, and which extends upwardly from said other flange in parallelism therewith.

3,851,432

MOTOR VEHICLE WINDOW MOLDING

Henry W. Griffin, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 10, 1973, Ser. No. 359,131
Int. Cl. E06b *3/30, 3/62*
U.S. Cl. 52—400 **1 Claim**



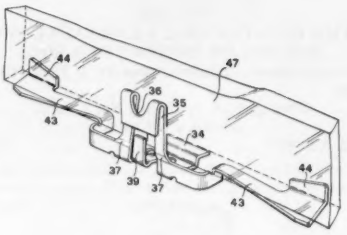
1. In a motor vehicle body having a window opening defined by flanged body panels, a window glass for closing the window opening and when mounted therein having a space between the edge of the window glass and a flange of the body panel, and a bead of curable adhesive mounting the window glass to the flanged body panels, a molding for concealing the space between the edge of the window glass and said flange of the body panel and comprising: a decorative trim portion bridging the space between the window glass and the body panel and extending a distance thereon, first and second legs extending continuously along the length of the molding and extending generally perpendicularly from the decorative trim portion respectively adjacent said flange of the body panel and the edge of the window glass, said first leg having a flange portion extending laterally thereof and biased to a reversely bent position engaging said flange of the body panel during insertion of the first leg into the bead of curable adhesive, the engagement of the reversely bent flange portion of the first leg with said flange of the body panel resiliently biasing the molding toward the edge of the window glass, a plurality of openings at spaced intervals in the first leg to allow flow of the curable adhesive behind the reversely bent flange portion of the first leg to provide complete embedment of the first leg in the bead of curable adhesive, said second leg having a forwardly bent flange portion for insertion into the bead of curable adhesive, the resilient biasing action of the first leg causing the edge of the window glass to be wedgingly engaged between the decorative trim portion and the forwardly bent flange portion whereby the window glass is positioned by the molding centrally of the window opening and the decorative trim portion is engaged against the window glass.

3,851,433

WINDSHIELD AND OR REAR WINDOW POSITIONING MEMBER AND ATTENDANT PERIPHERAL GLASS RIM IN MOTOR CAR BODIES

Ivo Colucci, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Continuation of Ser. No. 200,949, Nov. 22, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,428
Claims priority, application Italy, Nov. 24, 1970, 32141/70; Sept. 23, 1971, 29006/71
Int. Cl. E04f *19/02*
U.S. Cl. 52—401 **2 Claims**



1. A member for positioning a window in a seat of a motor vehicle body and also adapted to have a perimetral embellishing rim of the window applied thereto and in which the embellishing rim is provided with two curved edges, comprising a metal piece having a central portion, a first tongue integral with the central portion and extending in a plane essentially perpendicular to that of the central portion, at least a second hook-shaped tongue integral with the central portion, said first tongue having a free end bent to provide a rounded corner for receiving by a snap fitting, one curved edge of the embellishing ring, the second curved edge of the embellishing ring being fitted on said second tongue, two L-shaped side arms integral with and extending outwardly from said first tongue, each side arm having a first portion substantially co-planar with the first tongue and a second portion substantially perpendicular to said first tongue, and a resiliently yieldable wing at the free end of each second portion lying in a plane essentially perpendicular to that of said first tongue, said wings being obliquely inclined with respect to the plane of the central portion and to the plane of said first tongue so that the wings before assembling of the window are spaced from said first tongue by a distance lesser than the thickness of the window, with the window upon assemblage being forcingly inserted between said first tongue and the wings and with the perimetral contour of the window abutted against said wings.

3,851,434

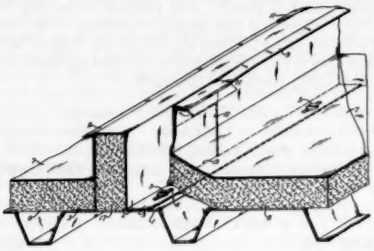
BATTEN ROOF AND SHEET METAL BATTEN

Thomas J. Boyd, Box 500 Rt. 1, Wellsburg, W. Va. 26070

Filed Nov. 5, 1973, Ser. No. 412,720
Int. Cl. E04d *1/36*
U.S. Cl. 52—465 **7 Claims**

1. A batten roof comprising laterally spaced parallel sheet metal roofing pans each having upwardly extending sides with inturned flanges along their upper edges, and a batten between each pair of pans, each batten being in the form of an inverted sheet metal channel having spaced sides with outwardly extending supporting flanges along their lower edges projecting beneath the adjoining pans, the upper edges of the channel sides being integrally connected by a web, the pan sides substantially engaging the channel sides between each pair of pans, each of said channel sides being cut to provide it with a plurality of tongues spaced lengthwise thereof and integrally connected at one end to that side adjacent the

channel web, and the tongues being bent upwardly between the channel sides and adjoining pan sides and then hooked



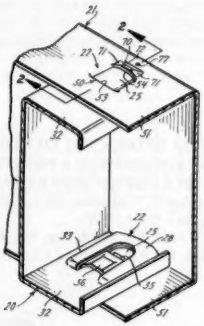
around the adjoining pan flanges to anchor the pans to the batten.

3,851,435

FASTENING MEANS FOR JOINING MEMBERS

H. Evan Roberts, St. Louis, and Alan E. Gickler, Warrenton, both of Mo., assignors to The Binkley Company, Warrenton, Mo.

Filed Jan. 8, 1973, Ser. No. 322,016
Int. Cl. F16b *5/06*
U.S. Cl. 52—754 **9 Claims**



1. A fastener for joining members together, said fastener comprising a tongue means formed in a first member to be joined, said tongue means having a first protrusion extending from one of its sides, a groove means formed in a second member to be joined, said groove means having a spanning member which extends at least part way over the side of the tongue means from which the protrusion extends with the tongue means inserted into the groove means, and a second protrusion operatively positioned relative to said tongue and groove means so as to urge the tongue means against the spanning means with the tongue means fully inserted into said groove means.

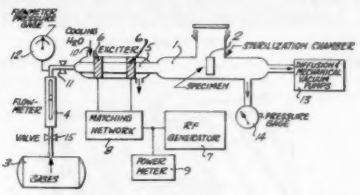
3,851,436

STERILIZING AND PACKAGING PROCESS UTILIZING GAS PLASMA

Sheila J. Fraser, Seattle; Roger B. Gillette, Auburn, and Richard L. Olson, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 13, 1971, Ser. No. 207,487
Int. Cl. B65b *31/02, 55/12*
U.S. Cl. 53—21 FC **6 Claims**

1. The process of sterilizing an article which comprises enclosing the article in a container, enclosing the container in a sealable chamber, maintaining subatmosphere pressure in the chamber and in the container, and, while maintaining such subatmosphere pressure in the chamber and in the container, flowing nonoxidizing gas plasma into the container, over a



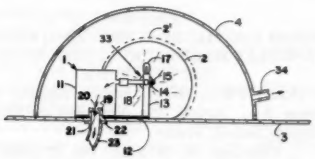
surface of the article to be sterilized and then out of the container into the portion of the chamber exteriorly of the container, terminating such flow of gas plasma through the container, and sealing the container to form a sterilized package for the article.

3,851,437

RECEPTACLE EVACUATION APPARATUS AND METHOD

Thomas E. Waldrop, and Stanley D. Hall, both of Greer, S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Dec. 10, 1973, Ser. No. 423,345
Int. Cl. B65b *31/02, 31/04*
U.S. Cl. 53—22 B **14 Claims**



1. In the method of evacuating receptacles within a vacuum chamber, the improvement which comprises:

a. providing a portable vacuum reservoir;

b. placing said receptacle and said reservoir within a vacuum chamber, said reservoir being in communication with the interior of said receptacle;

c. evacuating said reservoir and said receptacle;

d. sealing the evacuated reservoir while leaving it in communication with the receptacle; and,

e. removing the receptacle and reservoir from said chamber and thereafter closing said receptacle.

3,851,438

METHOD OF PRODUCING A UNIT PACKAGE CONTAINING BITUMINOUS MATERIAL

Sven Brynolf Brisman, Gothenburg, Sweden, assignor to AB Nynas-Petroleum, Stockholm, Sweden

Continuation of Ser. No. 80,024, Oct. 12, 1970, abandoned. This application Mar. 24, 1973, Ser. No. 343,091
Claims priority, application Switzerland, Oct. 22, 1969, 1445/69
Int. Cl. B65b *63/08*
U.S. Cl. 53—23 **6 Claims**

1. A method for packaging a material consisting of oxidized asphalt which comprises:

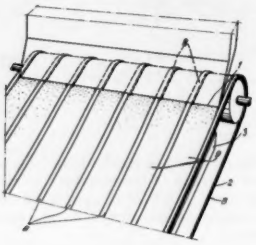
a. introducing into a cooling zone a material consisting of oxidized asphalt,

b. spreading said molten oxidized asphalt upon a chilled support surface as it enters the cooling zone, into a plurality of essentially parallel and laterally confined thin strips that have widths much greater than their thickness,

c. the thickness of each of said chilled confined thin strips being between about 25 and 30 mm,

d. cooling both the lower and upper surfaces of said plurality of confined thin strips for a sufficient time and at a fast enough rate so as to produce cooled thin strips consisting of oxidized asphalt that each:

1. have a 4 – 5 mm thick crust on the upper surface,
2. have a 4 – 5 mm thick crust on the lower surface, and
3. have an interior portion between said crusts that is



hot and unsolidified, said crusts having a thickness sufficient to resist the remelting effect caused by heat radiating from the inner hot portions of the layer,

e. cutting the strips formed from step (d) into slabs of the desired size, and

f. wrapping the thus formed slabs with at least one layer of packaging material, and assembling the wrapped slabs into unitary packages.

3,851,439

METHOD AND MACHINE FOR CONSTRUCTING A RECTANGULAR SIDED PACKING AROUND AN OBJECT OF ANY SHAPE

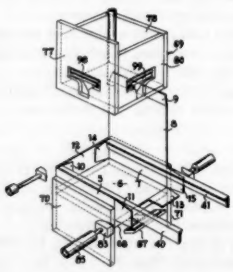
Marcel Octave Pillon, Gergy, France, assignor to Pont-A-Mousson S.A., Societe Des Embalia-Ges Moules, Sem, Montrouge, both of, France

Filed Jan. 30, 1973, Ser. No. 327,909

Claims priority, application France, Feb. 22, 1972, 72.04809

Int. Cl. B65b *5/02*

U.S. Cl. 53—29 **20 Claims**



1. In a method for making a packing having folded rectangular side wall portions around an object which may be incapable of affording a support when folding said wall portions, and comprising starting with a pre-cut and pre-scored blank of sheet material, folding up from a first portion of said blank at least a second blank portion and a third blank portion which adjoin said first blank portion so as to constitute two parallel wall portions of the packing interconnected by an intermediate wall portion of the packing, introducing the object to be packed in the thus partly formed packing and folding remaining portions of the blank to form the finished packing; the feature that, before folding said remaining portions of the blank, rigid support means defining two parallel edges are introduced into said partly-formed packing and positioned parallel to said two parallel wall portions so that said edges are placed in adjoining relation to said two parallel wall portions to support said two parallel wall portions along fold lines about which edges and fold lines two portions of the blank among said remaining portions are folded, said support means being withdrawn from the partly-formed packing before folding the remaining portions of the blank.

3,851,440

PACKAGING METHOD

Eugene G. Horsky, Claymont, Del., assignor to FMC Corporation, Philadelphia, Pa.

Filed Nov. 13, 1972, Ser. No. 306,364

Int. Cl. B65b *11/54*

U.S. Cl. 53—34 **7 Claims**

39

1. An article packaging method including the steps of containing an article which is to be packaged within a flexible bag, twisting the bag on itself at a location between its open end and the contained article to provide an envelope encasing the article, stretching at least an annular section of the portion of the bag extending between the twisted section and the open end thereof, urging such portion of the bag onto the encased article as an overlying envelope, and at least partially relaxing the stretched section of the overlying envelope to cause the same to engage snugly with the article encasing envelope.

3,851,441

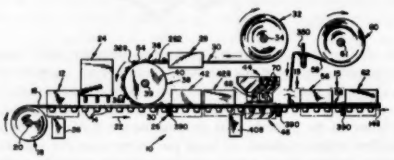
MACHINE FOR PRODUCING FILLED TWO-LIDDED PLASTIC CONTAINERS WITH A DRINKING STRAW AND A PUNCTURABLE DEPRESSION IN EACH LOWER LID

Jacques J. Marchand, Montclair, N.J., assignor to First Dynamics, Inc., New York, N.Y.

Filed Sept. 25, 1973, Ser. No. 400,635

Int. Cl. B65b *3/02, 43/08, 63/04*

U.S. Cl. 53—116 **15 Claims**



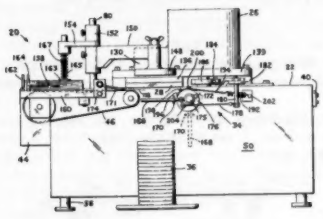
1. In combination, a machine including an elongated frame having the top thereof lying in a substantially horizontal plane and having upstream and downstream ends, means mounting a first roll of a first plastic web, means mounting a second roll of a second plastic web, and means mounting a third roll of a third plastic web, said first roll being mounted adjacent the upstream end of said frame, said second roll being mounted above said plane, means for moving said first web step-by-step along the top of said frame toward the downstream end thereof, a first thermal forming means for forming said first web into successive clusters of downwardly extending containers open at the top and rectangular in outline during the intervals between the step-by-step movements of said first web, liquid filling means mounted above said frame downstream of said first forming means for successively filling the

formed clusters of containers during said intervals, a roller mounted above said plane to downstream of said filling means between said filling means and said second roll and having its peripheral edge close to said plane, said second web passing around said roller and extending from the bottom of said roller downstream substantially in contact with said formed first web, means for moving said second web downstream from said roller in harmony with said step-by-step movements of said first web, a second thermal forming means mounted between said second roll and said roller for forming said second web into like clusters of first container lids including a straw-receiving recess in each of said lids, a first sealing means mounted downstream of said roller for sealing said first lids to said filled containers, straw-supplying means mounted downstream of said first sealing means for depositing a straw into each of said recesses of the clusters of first lids during said intervals, said third roll being mounted downstream of said straw-supplying means, means for moving said third web downstream in harmony with said step-by-step movements, a second sealing means mounted on said frame downstream of said straw-supplying means and having said third web extending downstream thereunder for sealing the same on said first lids thereby providing second lids, and trimming means mounted downstream of said second sealing means for simultaneously separating the clusters of two-lidded containers from said three webs and from each other during said intervals, said separated clusters then being discharged into a suitable receptacle.

3,851,442
APPARATUS FOR FORMING, INTERLEAVING AND DISPENSING FOOD PATTIES

Bernard Miles, 285 Vermont Ave., Irvington, N.J. 07111

Filed Dec. 21, 1972, Ser. No. 317,439
Int. Cl. B65b *25/08, 35/50, 41/02*
U.S. Cl. 53—122 **20 Claims**



1. Means for interleaving and stacking formed food patties, comprising:

a support means;

means to periodically dispense individual interleaving sheets onto said support means, comprising:

a continuously moving conveyor belt;

means to hold a stack of individual interleaving sheets in contact with said continuously moving conveyor belt; and

means to press a stack of sheets against said conveyor belt to cause a single interleaving sheet in contact with said conveyor belt to separate from said stack of interleaving sheets and be drawn along said conveyor belt to said support means;

means to periodically dispense formed food patties onto said interleaving sheets on said support means;

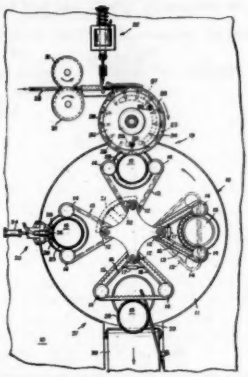
means to sequentially synchronize the dispensing of said interleaving sheets and said formed patties onto said support means; and

means to remove said support means from beneath said interleaving sheets and formed patties on said support means faster than the rate of free fall of said interleaving sheets and formed patties, so that said interleaving sheets and formed patties will be free to fall without contacting said support means.

3,851,443
CAN SEAL APPLIER

Harry Harold Fine, Kew Garden Hills, N.Y., assignor to The Schlegel Manufacturing Company, Rochester, N.Y.

Filed May 7, 1973, Ser. No. 357,824
Int. Cl. B65b *13/16*
U.S. Cl. 53—139.3 **7 Claims**



1. A can seal applier comprising:

a. an indexing mechanism;

b. a plurality of endless belt and pulley sets arranged at four stations on said indexing mechanism;

c. each of said pulley sets including a drive pulley and a pair of movable idler pulleys;

d. means for closing said movable pulleys against opposite sides of said can at a first station to wrap said endless belt around half of the cylindrical circumference of said can and hold said can on said indexing mechanism;

e. means for feeding a continuous seal strip to a second station;

f. means for cutting off a length of said seal strip;

g. a rotatable vacuum gripper wheel for holding said cut off length of said seal strip;

h. means for rotating said drive pulley at said second station to rotate said can with said belt;

i. said vacuum gripper wheel engaging and rotating with said can at said second station to wrap said seal around said can;

j. said vacuum gripper wheel having rims straddling said seal and a channel between said rims for pressing said seal onto said can to be supported on said can;

k. means at a third station for gripping and joining the free ends of said wrapped seal; and

l. means for opening said movable pulleys away from said can at a fourth station to release said can and move said can off said indexing mechanism.

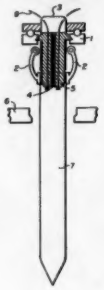
3,851,444
APPARATUS FOR OPENING AND PROTECTING FROM CONTAMINATION HEAT-SEALABLE BAGS

Jean-Pierre Merat, 4, rue Robert Giraudineau, Vincennes, France

Continuation-in-part of Ser. No. 799,720, Feb. 17, 1969, abandoned. This application May 4, 1973, Ser. No. 357,110
Int. Cl. B65b *43/26*
U.S. Cl. 53—167 **2 Claims**

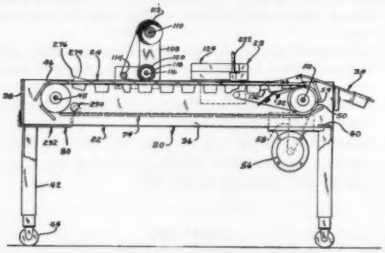
1. An apparatus for filling and sealing a bag having an upwardly turned mouth, comprising:

a filling station provided with an outlet;
a pair of horizontally extending support rails running from the region of said outlet;
a carriage mounted on said support rails and horizontally displaceable thereon from said region to another region;
a bag-sealing station at said other region for sealing the mouth of a bag;
a pair of leaf springs having opposite extremities lying substantially against one another and mounted on said carriage;
means on said carriage for relatively displacing the opposite extremities of said leaf springs toward and away from one another to alternately spread said leaf springs apart between their extremities to spread the mouth of a bag fitted over said leaf springs;



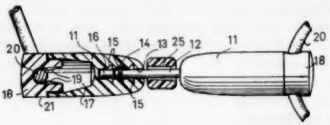
resilient layers disposed along at least opposite lateral faces of said leaf springs for contacting internal surfaces of said bag along said mouth for preventing contamination thereof;
means displaceable from one of said regions toward the other region for entraining said carriage therebetween along said rails; and
horizontally movable abutments at least at the first mentioned region for laterally engaging external surfaces of a bag spread by said springs.

3,851,445
PACKAGING MACHINE
Frank R. Schuh, 445 Chatham Cir., Buffalo Grove, Ill. 60090
Filed Aug. 28, 1972, Ser. No. 284,451
Int. Cl. B65b *7/16*
U.S. Cl. 53—329 **13 Claims**



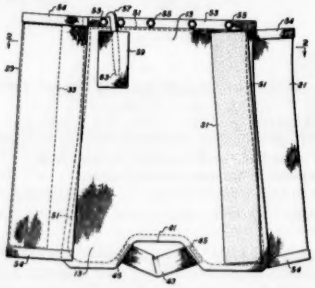
1. A packaging machine including a base, a continuous conveyor mounted on the base, said conveyor including a drive chain, a plurality of platens releasably locked to the drive chain, each of said platens adapted for carrying a container having an open side, means for driving the drive chain to move the conveyor, a sealing assembly mounted on the base and being cooperative with the conveyor, said sealing assembly including means for applying a continuous film of material to the open side of each of the containers carried by the platens, the conveyor includes a second drive chain spaced apart from the first-mentioned drive chain and is driven simultaneously therewith, each of the platens of the conveyor having a pair of clips on opposite sides thereof engageable with a portion of one of the drive chains to hold the platen onto the clip, and a platen release mounted on the base and being selectively engageable with the clips for releasing selectively the platens from the chains to remove the platens.

3,851,446
SNAFFLE BIT
Lorenz Bischeltsrieder, Furstenfeldbruck, Germany, assignor to Stuben GmbH, Stans, Switzerland
Filed May 19, 1972, Ser. No. 255,218
Claims priority, application Germany, May 21, 1971, 2125333
Int. Cl. B68b *1/06*
U.S. Cl. 54—8 **14 Claims**



1. A snaffle bit comprising a pair of bit portions, each of said bit portions having an axial bore which includes annular grooves; an elastic hinge rod portion extending between and connecting said bit portions, said hinge rod portion having its ends stationarily fixed to said bit portions and each end of said hinge rod portion including a rib which engages in one of said annular grooves; and a ring connected to the outer end of each of said bit portions for receiving a snaffle rein.

3,851,447
PNEUMATIC LEGGING FOR HORSES
Armand Pontarella, 36 Lansing Cir. North, Rochester, N.Y. 14624
Filed Sept. 19, 1973, Ser. No. 398,797
Int. Cl. B68c *5/00*
U.S. Cl. 54—80 **6 Claims**



1. A pneumatic legging for treating the leg of a horse, comprising two thicknesses of fabric forming a pocket between them, fastener means for holding said fabric detachably in a position wrapped around the leg of a horse at an elevation at least mainly above the fetlock of such leg, an air-retaining bladder within said pocket, said pocket being substantially permanently closed at three edges and being open at a fourth edge for easy removal and insertion of said air retaining bladder, other fastener means for keeping said fourth edge sub-

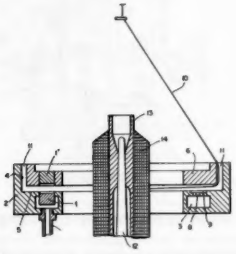
stantially closed except when it is to be opened for insertion or removal of said bladder, and a valved air tube extending from said bladder to an accessible location externally of said pocket, for introducing air into and releasing air from said bladder, to adjust the pressure of the legging against the leg of the horse without having to remove the legging from the leg.

3,851,448

YARN TWISTING APPARATUS

Takao Sano; Katsuhiro Fukuda, both of Otsu; Akio Ando, Okazaki, and Louzou Tameno, Shiga-ken, all of Japan, assignors to Tory Industries, Inc., Tokyo, Japan

Filed July 18, 1973, Ser. No. 380,211
Claims priority, application Japan, Aug. 19, 1972, 47-83095
Int. Cl. D01h *7/58*
U.S. Cl. 57—75 **31 Claims**



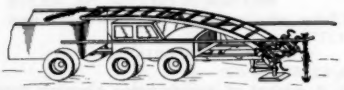
1. A yarn twisting apparatus comprising, in combination:
a. a spindle arranged to carry a bobbin for winding yarn,
b. a ring arranged for guiding said yarn to said bobbin, said ring substantially surrounding said spindle,
c. a ring holder also substantially surrounding said spindle and moving back and forth generally axially of said spindle, the ring holder including a fluid chamber, an annular surface for mounting said ring loosely, means for projecting compressed fluid through said annular surface from said fluid chamber, and
d. means for applying magnetic force by which said ring is attracted substantially toward said annular surface through which said compressed fluid is projected, so that said ring is supported in space in a stable condition balanced by the magnetic force and by the forces attributable to said compressed fluid.

3,851,449

SUGAR CANE HARVESTER

Ramon Reyes Medina, 1113 Center Rd., Wilmington, Del. 19805

Filed June 6, 1973, Ser. No. 367,479
Claims priority, application Spain, June 8, 1972, 403,670
Int. Cl. A01d *45/10*
U.S. Cl. 56—14.3 **3 Claims**



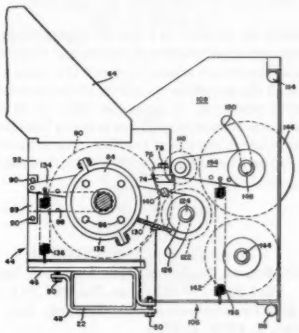
1. A harvester for a crop such as sugar cane and the like, comprising a chassis mounted for movement over the ground, a horizontal cutter carried by the chassis, means to reciprocate the cutter forwardly and rearwardly relative to the chassis to cut the crop, endless gathering conveyors on either side of the chassis for gathering the cut crop, an endless conveyor for receiving the cut crop from said gathering conveyors and for conveying the cut crop to the rear, power means common to said cutter and gathering conveyors and endless conveyor simultaneously to reciprocate said cutter and to circulate said gathering conveyors and said endless conveyor, said gathering conveyors comprising endless conveyor chains having gathering arms outstanding therefrom, and guide rails carried by said chassis and disposed above and contacting said gathering arms a distance from the junction of said gathering arms and the chains associated therewith.

3,851,450

FORAGE HARVESTER

Leon Franklin Nelson, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed June 1, 1973, Ser. No. 365,989
Int. Cl. A01d *87/00*
U.S. Cl. 56—14.4 **21 Claims**



1. A forage harvester comprising: a mobile main frame mounted for advance over a field, a cutterhead housing mounted on the frame and having a crop inlet and a crop outlet spanning the width of the housing and a discharge spout extending upwardly from the outlet; a crop-feeding means mounted on the frame for moving crop material through the inlet; a forward harvesting means mounted on the frame for removing the crop from the field as the harvester advances and delivering it to the crop-feeding means; a shear bar disposed along the upper edge of the crop inlet; a cylinder-type cutterhead mounted in the cutterhead housing and having a plurality of knives with cutting edges on the cutterhead periphery tracing a cylinder in registry with the shear bar as the cutterhead rotates and having an axial length less than 12 inches; means for driving the cutterhead at a speed above 1,600 RPM so that the knives move upwardly past the inlet at a high velocity to reduce the crop moving through the inlet under the shear bar and impel the reduced crop tangentially upwardly through the outlet and the discharge spout.

3,851,451

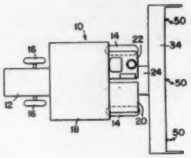
AUTOMATIC HEIGHT CONTROL SYSTEM FOR A CROP HARVESTER

Jay Byron Agness, East Moline; Duane Herbert Ziegler, Moline, and Garn Farley Penfold, East Moline, all of Ill., assignors to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 237,334, March 23, 1972, abandoned. This application Aug. 31, 1973, Ser. No. 393,304
Int. Cl. A01d *75/18*
U.S. Cl. 56—10.2 **13 Claims**

1. In a crop harvester having vertically adjustable crop-gathering means and hydraulic power means for raising and lowering the crop-gathering means when fluid is supplied thereto and exhausted therefrom respectively, an automatic height control comprising: a plurality of individually movable ground followers mounted on the crop-gathering means in

transversely spaced relationship and for pivotal movement in a generally vertical path; electrical switch means associated with each follower and each switch means including an actuation member movable with its respective ground follower between raise, hold and lower positions; a solenoid valve movable between raise, hold and lower modes controlling the flow of fluid to and from the hydraulic power means; electrical circuit means including a source of electrical energy connected to and for controlling the movement of the solenoid



valve between its modes; the circuit means including logic means connected to all the switch means and responsive to the conditions of the switch means to move the valve to its lower mode when all the actuation members of the switch means are in their lower positions, to move the valve to its hold mode when at least one actuation member is in the hold position and the remainder are in the lower position, and to move the valve to its raise mode when any one of the actuation members is in its raise position.

3,851,452

GUARDED ROTARY MOWERS

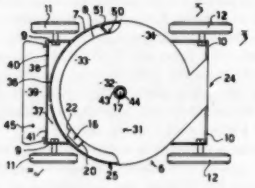
Alexander N. Brocas, 26 Stanton Ter., Auckland, New Zealand

Filed Jan. 19, 1971, Ser. No. 107,713

Claims priority, application New Zealand, Jan. 23, 1970, 159036; Apr. 8, 1970, 159781

Int. Cl. A01d *35/12*

U.S. Cl. 56—17.4 **18 Claims**



1. A safety guard for a rotary mower of the type including a housing which is open at its bottom and a cranked blade having a central portion and one or more cutting tips which are lower than the central portion, the blade being rotatable in a substantially horizontal plane, within the housing, said safety guard comprising an inverted dish-shaped body; having a central portion and peripheral portions lower than the central portion, the guard being adapted to be fastened under the blade to the housing with the central portion of the guard being adjacent the central portion of the blade and the peripheral portions adjacent the one or more cutting tips, so that the path swept by the blade during a revolution is suitably inaccessible from below but the portion of the periphery of the guard at the front being formed to uncover only the effective cutting portions of the cutting tips of the blade around a part annular portion to allow a substantially unrestricted width of swath to be cut as the mower is propelled therealong, the front peripheral portion of the guard being inclined upwardly to provide a ski effect in use guiding the guard over obstructions and minimizing the tendency for the guard to dig in when the mower is being propelled.

3,851,453

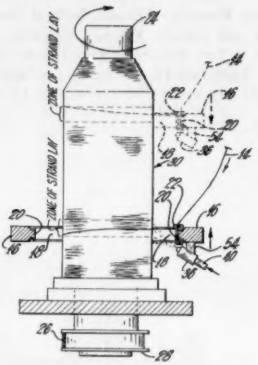
APPARATUS FOR AND METHOD OF PACKAGING LINEAR MATERIAL

Cletis L. Roberson, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 2, 1973, Ser. No. 356,537

Int. Cl. D01h *13/26*; **C03b** *37/02*; **F26b** *7/00*

U.S. Cl. 57—34 R **3 Claims**



1. Twist frame apparatus for packaging linear material comprising:

means for supplying wet linear material along a given path;

a rotatable collector upon which the linear material is wound into successive layers as a package;

means for rotating the collector;

a ring rail having a circular opening for extension of the rotatable collector therethrough;

a traveler through which the linear material is advanced along its path to the collector during package formation, the traveler being mounted for circular movement on the ring rail at the circumference of the circular opening;

means for reciprocating the ring rail axially of the collector; and

means effective to increase the rate of evaporation of liquid from successive outer layers of the wet linear material as the layers are being formed including a nozzle on the ring rail immediately adjacent the package for directing a stream of drying gas onto a portion of the outer circumferential surface of the package and means for supplying the gas under pressure to the interior of the nozzle, the nozzle being moved back and forth axially of the package with the ring rail as the ring rail is reciprocated to progressively subject the exterior of the package to the drying influence of the stream during package formation.

3,851,454

METHOD OF AND DEVICE FOR THE MANUFACTURING OF ELECTRICAL CONDUCTORS

Jeno Beyer, Delft, and Leonardus Eduard Govaert, Venlo, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 7, 1973, Ser. No. 395,018

Claims priority, application Netherlands, Sept. 30, 1972, 7213274

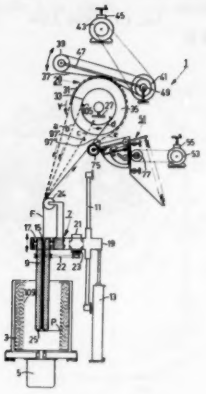
Int. Cl. D01h *7/84*, *9/06*

U.S. Cl. 57—34 CP **6 Claims**

1. A method of manufacturing electrical conductors, in which a number of individual metal wires are unwound from spools, are assembled to form a strand which is fed to a twisting device, said strand being twisted while passing through the twisting device, and the electrical conductor thus obtained is wound onto a spool, comprising the steps of:

bundling a number of individual metal wires on a doubling machine to form a strand in a first process phase;

winding said strand onto a spool;
placing said spool in a twisting device;
unwinding said strand from said spool, feeding said strand through a guide into a rotating container and depositing said strand regularly along the inner wall of the container so as to subject the strand to a first twist; and



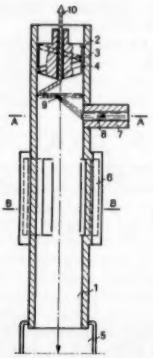
then driving said spool so as to reverse the direction of movement of said wire strand, thereby withdrawing the strand from the container and rewinding said strand onto the same spool, while maintaining the direction of rotation of the container, so as to subject said strand to a second twist.

3,851,455

METHOD FOR MANUFACTURING YARN FROM NATURAL AND CHEMICAL FIBERS AND A DEVICE FOR CARRYING OUT THE METHOD

Ryszard Jozwicki; Henryk Kubica; Waclaw Ankudowicz; Tadeusz Jedryka; Stanislaw Kurzyniec; Roman Swietoslawski; Franciszek Olczyk, all of Lodz, Poland; Irena Teresa Roszewska-Hunsza, deceased, late of Lodz, Poland (Zdislaw Henryk Hunsza, heir), and Agata Beata Hunsza, Lodz, Poland (heir-in-law), assignors to Instytut Wlokiennictwa, Lodz, Poland

Filed Sept. 13, 1971, Ser. No. 179,898
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.95 **14 Claims**



1. A method of producing yarn comprising the steps of:
a. creating a planar air vortex with no axial component in a cylindrical chamber between a closure member and a plurality of tangential air inlets by admitting air into said inlets and past said member while withdrawing air under suction at a location remote from said chamber to the side of said inlets opposite that at which said chamber is formed;
b. introducing fibers into said vortex at a location between said inlets and said member whereby said fibers whirl about centrifugally in a ring in the plane of said vortex; and
c. withdrawing a yarn from said vortex whereby fibers from said ring intertwine with one another to elongate said yarn as the same is withdrawn.

3,851,456

ANTISTATIC YARN CONSISTING OF A MIXTURE OF METALLIC AND NONMETALLIC FIBERS

Koichi Hamada, and Tatsuya Kunieda, both of Osaka, Japan, assignors to Nippon Seisen Co., Ltd., Osaka, Japan

Filed July 24, 1973, Ser. No. 382,191
Int. Cl. D02g *3/12*
U.S. Cl. 57—140 BY **4 Claims**

1. An antistatic yarn comprising, in combination:
a first plurality of metallic fibers;
a second plurality of nonmetallic fibers;
each of said metallic fibers having a polygonal cross section to have at least one substantially sharp-edged corner disposed along substantially the entire length of said metallic fiber, said corner serving to collect static charges formed in said yarn and to dissipate said static charges across the entire length of said yarn, said polygonal cross section serving to enhance binding between said metallic fibers and said nonmetallic fibers; and
said first plurality of metallic fibers and said second plurality of nonmetallic fibers being combined so that a substantial number of said metallic fibers are arranged adjacent the outer periphery of said antistatic yarn.

3,851,457

CORE YARNS AND METHODS FOR THEIR MANUFACTURE

Graham Thomas Waters, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 260,934, June 8, 1972, Pat. No. 3,780,515, which is a division of Ser. No. 125,683, March 18, 1971, Pat. No. 3,691,750, which is a continuation-in-part of Ser. No. 865,598, March 10, 1969, Pat. No. 3,557,873. This application Apr. 9, 1973, Ser. No. 349,164
Int. Cl. D02g *3/38*; D02j *1/12*
U.S. Cl. 57—144 **9 Claims**

1. A well integrated core yarn comprising a core component of set false twisted synthetic continuous filaments and at least one wrapping component of synthetic continuous filaments which are formed in helices, the directions of which helices reverse at intervals along the yarn, said core yarn having a

decitex as defined hereinbefore within the range 120 to 400 inclusive and said core component having a decitex as defined

hereinbefore between 25 and 40 percent of the decitex of said core yarn.

3,851,458

ELECTRICAL ALARM DEVICE FOR AN ALARM CLOCK

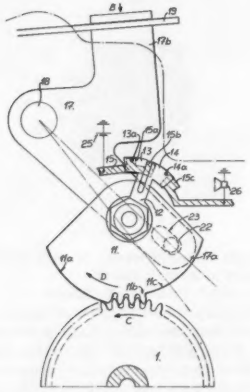
Samuel Schwab, Delemont, Switzerland, assignor to Louis Schwab, S.A., Delemont, Switzerland

Filed Oct. 2, 1973, Ser. No. 402,789

Claims priority, application Switzerland, Oct. 2, 1972, 14381/72

Int. Cl. G04c *21/16*

U.S. Cl. 58—20 **5 Claims**



1. In an alarm clock, an electrical circuit having an electrically energized alarm, a driven spindle, an alarm first gear rotatable on said spindle and movable axially thereon, an alarm time-setting gear for presetting the time said alarm is to be energized and having a coupling recess on a side surface thereof, a driven gear rotatable on said spindle and having a coupling projection on a side surface thereof for engaging in said coupling recess of said alarm time-setting gear and coupling it to said driven gear when said coupling projection and coupling recess are in registry, resilient biasing means resiliently biasing the driven gear toward said alarm time-setting gear for coupling thereof when said preset time obtains and uncoupling thereof after the alarm has been energized, a one-way clutch having a clutch element fixed to said spindle and a second clutch element thereof on said first gear for driving said first gear when said biasing means couples said driven gear and said alarm time-setting gear, said biasing means having means for effecting clutching of said clutch and declutching thereof when said alarm time-setting gear and driven gear are coupled and uncoupled respectively, program means driven by said first gear when driven by said spindle controlling energizing of said circuit for sequential spaced intervals to energize said alarm during said intervals.

3,851,459

ELECTRIC WATCH

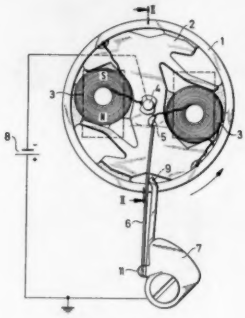
Heinz Meitinger, Mutlangen, Germany, assignor to Bifora-Uhren J. Bidlingmaier GmbH, Schwabisch Gmund, Germany

Filed Jan. 15, 1974, Ser. No. 433,526

Claims priority, application Germany, Jan. 20, 1973, 2302884

Int. Cl. G04c *3/04*

U.S. Cl. 58—28 B **4 Claims**



1. An electric watch comprising an oscillating balance, coils mounted on said balance, stationary magnets to generate a magnetic field intersecting said coils during oscillation of said balance, a source of DC voltage, and contact means to feed said coils with current from said source in dependence of the angular position of said balance, said contact means comprising a terminal member mounted on said balance and connected to said coils, the improvement comprising that said contact means comprises a rigid stationary stop member and a contact spring electrically insulated with respect to said stop member, said spring being urged in engagement with said stop member by said terminal member, said stop member being electrically connected to said source of DC voltage.

3,851,460

WATCH TIME DISPLAY ILLUMINATION

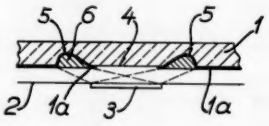
Pierre Michel Piquerez, Bassecourt, Switzerland, assignor to Ervin Piquerez S.A., Bassecourt, Switzerland

Filed Aug. 9, 1973, Ser. No. 387,021

Claims priority, application Switzerland, Aug. 14, 1972, 12006/72; June 7, 1973, 8246/73

Int. Cl. G04b *19/30, 39/00, 19/06*

U.S. Cl. 58—50 A **5 Claims**

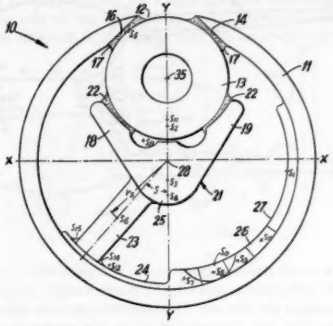


1. A watch comprising a time display zone, a transparency forming a watch glass, dial or case bottom, a luminescent material supported by the transparency, and a metallized layer applied on said transparency to reflect light emitted by said luminescent material towards said zone.

3,851,461
BALANCE WHEEL

Wilhelm Tilse, Pforzheim-Birkenfeld, Germany, assignor to Timex Corporation, Waterbury, Conn.

Continuation of Ser. No. 114,277, Feb. 10, 1971, abandoned. This application Dec. 22, 1972, Ser. No. 317,850
Int. Cl. G04c 3/04; G04b 17/00; H02k 33/00
U.S. Cl. 58—107 **5 Claims**



1. A balance wheel comprising:

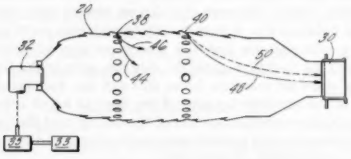
a balance body having an axis, a counterweight portion and at least one element subject to weight variations mounted on the other side of said axis from said counterweight portion to cause rotation of the body through an angle when the axis is horizontal and the wheel is not properly poised,

said counterweight portion being tapered in a peripheral direction so that said angle is determined by the amount of dispoise, and also varying in distance from said axis in a predetermined manner to facilitate removal of greater predetermined sections of said counterweight portion for correction of correspondingly lesser amounts of dispoise.

3,851,462
METHOD FOR REDUCING TURBINE INLET GUIDE VANE TEMPERATURES

Alexander Vranos, Rockville, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed June 29, 1973, Ser. No. 375,248
Int. Cl. F02c 7/12, 7/22
U.S. Cl. 60—39.06 **4 Claims**



1. In a gas turbine engine including a combustion chamber and a plurality of circumferentially spaced turbine inlet guide vanes positioned at the downstream end of the combustion chamber, said combustion chamber including at least one burner can having at least one row of circumferentially spaced combustion air holes through one wall thereof, the method of reducing the maximum temperature reached by said vanes including the steps of:

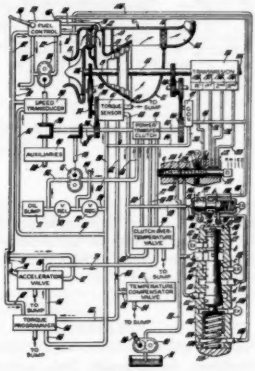
spraying fuel into the burner can; and

oscillating the fuel delivery into the burner can with a period of oscillation shorter than the turbine inlet guide vane thermal response time and at a selected frequency which is the frequency of one of the harmonics or subharmonics of the natural acoustic pressure oscillations of the combustion chamber.

3,851,463
GAS TURBINE ENGINE POWER SHIFT TRANSMISSION POWER TRAIN

Donovan L. Robinson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 21, 1972, Ser. No. 273,728
Int. Cl. F02c 3/10
U.S. Cl. 60—39.16 **15 Claims**



1. A power train comprising: in combination; a gas turbine power plant having a gas generator including a compressor providing a gas discharge pressure and combustion apparatus, turbine means gas-coupled to the gas generator, control means controlling the gas generator to provide a programmed output torque varying with compressor speed and turbine means speed; and a power shift transmission having an input operatively connected to said turbine means, a load output and a plurality of fluid-operated drive establishing devices for establishing a plurality of ratio drives between said input and output, governor means operatively connected to said turbine means providing a governor signal proportional to the speed of said turbine means, a source of fluid under pressure, regulator valve means operatively connected to said source, compressor and governor means regulating the pressure substantially proportional to the programmed engine output torque in response to gas discharge pressure and engine turbine means speed and shift control means operatively connected to said regulator valve means, and fluid operated drive establishing devices and operative under the control of said pressure regulated by said regulator valve means and selectively operating said devices for selectively engaging said drives.

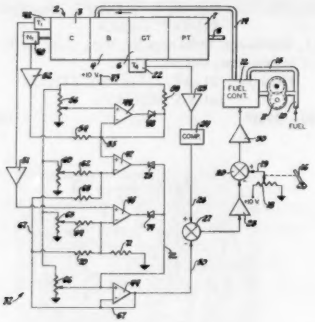
3,851,464
GAS TURBINE FUEL CONTROL

James L. Davis; Edward L. Lopke, both of Kokomo, and Leslie Joseph Pechous, Carmel, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1973, Ser. No. 392,738
Int. Cl. F02c 9/10
U.S. Cl. 60—39.28 T **5 Claims**

1. A system for establishing a schedule of turbine temperature for a gas turbine engine as a function of ambient temperature and turbine speed comprising, in combination, a first operational amplifier effective to provide a temperature limit signal; a second operational amplifier responsive to ambient temperature having its output connected to an input of the first operational amplifier so as to lower the limit signal progressively with decrease in ambient temperature; a third oper-

ational amplifier responsive to turbine speed having its output connected to the said input of the first operational amplifier so as to lower the limit signal progressively with decrease in turbine speed; the second and third operational amplifiers



being connected to the first operational amplifier so that the output calling for the lower limit signal prevails; and means connected to the third operational amplifier effective to provide a lower speed limit to the turbine speed responsive input of the third operational amplifier.

3,851,465

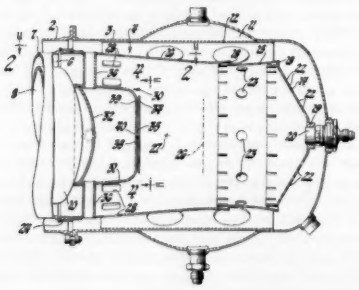
ANNULAR DILUTION ZONE COMBUSTOR

Albert J. Verdouw, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 6, 1973, Ser. No. 348,682

Int. Cl. F02c *3/04, 7/18*

U.S. Cl. 60—39.36 **5 Claims**



1. A combustion liner for a gas turbine combustion apparatus, the liner including an outer wall of generally circular cross-section having an upstream end and a downstream end, a dome closing the upstream end, and a substantially closed centerbody mounted in the downstream end, the centerbody and outer wall defining between them an annular outlet passage of substantially constant width from the liner; the dome providing for entrance of fuel; approximately the upstream third of the liner including the dome providing distributed entrances for combustion air and cooling air; at least approximately the central third of the liner wall being imperforate to avoid quenching of the combustion; and the outer wall having a ring of dilution air holes abreast of the centerbody to admit dilution air directly into the outlet passage for mixing with and cooling of the combustion products flowing through the outlet passage.

3,851,466

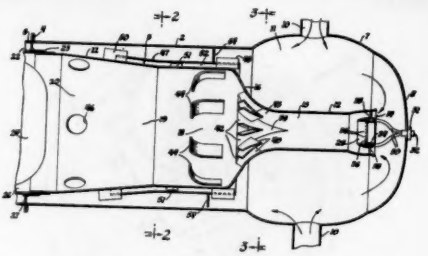
COMBUSTION APPARATUS

Albert J. Verdouw, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1973, Ser. No. 350,383

Int. Cl. F02c *3/06, 7/22*

U.S. Cl. 60—39.36 **5 Claims**



1. A combustion apparatus for a regenerative gas turbine engine or the like comprising, in combination, a casing having an upstream portion and a downstream portion and having an entrance for hot compressed air in the upstream portion; a combustion liner disposed within the casing having an upstream end in the upstream portion of the casing and a downstream end in the downstream portion of the casing; the casing and liner defining between them a space for the compressed air discharging into the liner, and the liner defining an outlet for combustion products at its downstream end; the liner including wall means defining, in flow sequence from its upstream end, a premix-prevaporization zone, a combustion zone, and a dilution zone; the premix-prevaporization zone having an open upstream end defining a primary air inlet adapted to admit air flowing axially of the zone without significant circumferential velocity; means in the air inlet for carburetting the air; the wall means defining a flare from the premix-prevaporization zone into the combustion zone; a centerbody disposed centrally of the flare effective to guide the flow along the inner surface of the wall means at the flare, the centerbody serving to heat additionally the carburetted air; the combustion zone being located immediately downstream of the flare and having substantially greater cross-sectional area than the premix-prevaporization zone, and including means effective to promote circulation and mixing in the combustion zone; shroud means spaced outwardly from the wall means extending downstream from the flare over the combustion zone effective to define a shallow flow path for convection cooling air over the exterior of the wall means; and blocking means between the shroud means and casing disposed between the upstream and downstream portions of the casing effective to direct a major portion of dilution air through the said flow path; the dilution zone of the liner having dilution air entrance holes through the wall means adjacent to the downstream end of the liner to admit dilution air from the downstream portion of the casing; and the liner wall means between the premix-prevaporization and dilution zones being substantially imperforate.

3,851,467

RECIRCULATING COMBUSTION APPARATUS JET PUMP

Warren S. Sherman, and Albert J. Verdouw, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

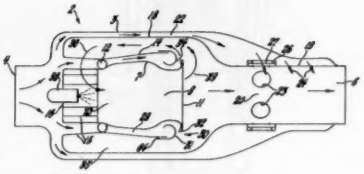
Filed July 2, 1973, Ser. No. 375,538

Int. Cl. F02c *3/00*

U.S. Cl. 60—39.65 **4 Claims**

1. A combustion apparatus comprising, in combination, an innermost wall defining a combustion zone having upstream

and downstream ends, an inner wall defining an annular air passage with the innermost wall, an outer wall defining with the inner wall an annular recirculation passage from the downstream to the upstream end of the combustion zone and defining a discharge passage from the combustion zone, and an outermost wall defining a dilution air passage with the outer wall to conduct air into the discharge passage; the downstream end of the inner wall being curved inwardly to form a forward boundary for a Coanda nozzle, and the downstream end of the innermost wall being curved outwardly to define a rear boundary for the Coanda nozzle, the Coanda nozzle encircling the downstream end of the combustion zone between the said curved ends adapted to discharge into the recirculation pas-



sage and entrain combustion products discharged from the combustion zone into the recirculation passage; comprising a structure in which the forward boundary of the nozzle is substantially radial, the rear boundary of the nozzle converges toward the forward boundary to define a converging air entrance to the nozzle such that a surface equidistant from the said boundaries is directed at an acute angle less than 30° to the forward boundary at the nozzle outlet, and the rear boundry terminates in a guiding surface directed at a small acute angle to a perpendicular to the adjacent forward boundary of the nozzle outlet, the guiding surface having a width greater than the width of the nozzle outlet; and a supplementary outlet means from the said air passage into the recirculation passage by-passing the Coanda nozzle.

3,851,468

APPARATUS FOR VARYING SEALING PRESSURES ON ABUTTING WALL PARTS, PARTICULARLY OF LIQUID FUEL ROCKET ENGINES FROM THE EXTERIOR OF SUCH ENGINES

Helmut Frankle, Heilbronn-Neckargartach, and Fritz Schmalzriedt, Weinsberg, both of Germany, assignors to Messerschmitt-Bolkow-Blohn Gesellschaft mit beschrankter Haftung, Munich, Germany

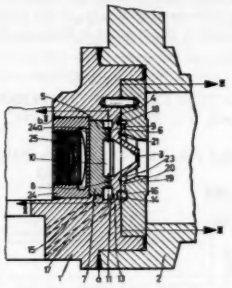
Filed Sept. 12, 1973, Ser. No. 396,358

Claims priority, application Germany, Sept. 23, 1972, 2246810

Int. Cl. F02k *9/02*; **B05b** *7/10*

U.S. Cl. 60—258 **5 Claims**

1. A device for sealing the surfaces of an assembled device, particularly by pressing together the sealing surfaces forming a head of a combustion chamber in a liquid fuel rocket engine, comprising a first wall having one face with a first sealing surface, a second wall member connected to said first wall, and having one face with a second sealing surface in abutting engagement with said first sealing surface and having an opposite face at its opposite end with a third sealing surface directed in the same direction as said first sealing surface, a thrust piece having a fourth sealing surface in abutting engagement with said third sealing surface, a pressure member connected to said second wall member, and having an elastic partition wall bearing against said thrust piece in a direction to urge it toward said first wall and said wall, and means engageable with said elastic partition to bend said partition toward said thrust piece to cause tighter sealing engagement



of said second and first sealing surfaces and said third and fourth sealing surfaces.

3,851,469

TEMPERATURE SUPERVISORY SYSTEM FOR EXHAUST GAS REACTORS FOR INTERNAL COMBUSTION ENGINES

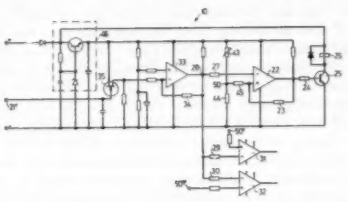
Dieter Eichler, Hochberg, and Walter Remmele, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Gerlingen-Schillerhoehe, Germany

Filed Aug. 23, 1972, Ser. No. 283,177

Claims priority, application Germany, Jan. 29, 1972, 2204286

Int. Cl. F02b *75/10*

U.S. Cl. 60—277 **14 Claims**



1. Temperature monitoring and protective supervisory system for the exhaust system of internal combustion engine systems including at least one reactor (**19**) in the exhaust system thereof to prevent damage to the reactor due to excessive temperatures comprising

a temperature sensing means (**21**) located in thermal sensing relationship to an element of the engine system and providing an electrical signal representative of temperature in the exhaust system of the engine and thus a measure of the operating condition of the reactor (**19**);

a threshold switch means (**10**) having a plurality of switching positions, each having a corresponding output, and each corresponding to a discrete temperature level as sensed by the temperature sensing means (**21**), to provide a plurality of theshold signals, each corresponding to a discrete temperature threshold level in excess of a predetermined temperature arising within the exhaust system of the engine;

and control means (**11, 12, 13, 16**) including an indicator means, and means connected to the engine system commanding operation of the engine system tending to reduce the operating temperatures arising within the exhaust system thereof, said control means being energized

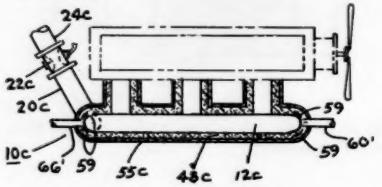
by said threshold switch means (10) when one of the threshold levels thereof is exceeded, the switch output of the respective threshold levels being connected to selectively activate said indicating means and said engine operating command means to permit corrective action to be taken before the reactor is being damaged.

3,851,470

ANTI-POLLUTION EXHAUST CONVERSION SYSTEMS

John Kaufmann, Jr., 3716 Woodrow Ave., Pittsburgh, Pa. 15227

Filed Feb. 11, 1972, Ser. No. 225,644
Int. Cl. F02b *75/10*
U.S. Cl. 60—298 **3 Claims**



1. An anti-pollution exhaust conversion system for an exhaust duct through which partially reacted exhaust gases are circulated, said system comprising induction and mixing means mounted in said exhaust duct for inducting and mixing a reactant fluid with said exhaust gases, a collector coupled to said exhaust duct and to a source of said gases, a variable insulator substantially surrounding said collector, said variable insulator having passage means extending therethrough for passage of a tempering fluid for varying the insulating characteristic of said variable insulator, means for supplying a reactant fluid to said induction and mixing means for induction thereby into said exhaust duct, means for varying the rate of flow of said tempering fluid through said variable insulator passage means, said tempering fluid varying means including means for coupling said insulator passage means to said induction and mixing means so that the flow of tempering fluid through said passage means is varied directly with the rate of flow of said exhaust gases through said exhaust duct, said source being an internal combustion engine having at least two banks of cylinders and an exhaust collector for each bank of said cylinders, each of said collectors being so provided with similar variable insulators each having tempering passage means, said induction and mixing means including a venturi member mounted adjacent the outlet of each of said collectors for inducting said reactant fluid into said exhaust system, exhaust conduit means coupling the outlets of each of said venturi members to said exhaust duct, said induction and mixing means further including an additional venturi member mounted in said exhaust duct downstream of the connection thereof to said exhaust conduit means, and suction conduit means coupling said additional venturi member to the tempering passage means of said variable insulators.

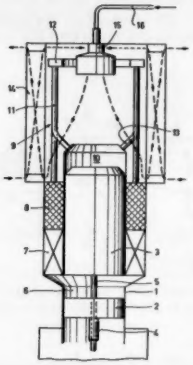
3,851,471

HOT-GAS ENGINE AND METHOD OF MANUFACTURING SAME

George Albert Apolonia Asselman, and Adrianus Petrus Johannes Castelijns, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 21, 1973, Ser. No. 372,282
Claims priority, application Netherlands, July 1, 1972, 7209298
Int. Cl. F02g *1/04*
U.S. Cl. 60—517 **14 Claims**

1. A hot-gas engine comprising one or more spaces of varying volume and higher mean temperature and one or more spaces of varying volume and lower mean temperature which are connected thereto, each of the connections between said spaces incorporating a regenerator, the said spaces and the connections therebetween being filled with a working medium which consists mainly of hydrogen and which flows to and fro through the regenerator, characterized in that the walls of the said spaces which are at a high temperature during operation and the walls of the connections are covered with a layer of



silicon nitride, the relevant wall portions having a concave shape and being made of a material having a thermal expansion coefficient which is of the same order or larger than that of the deposited silicon nitride, the silicon nitride layer being deposited by bringing the relevant wall portions in contact at higher temperatures with a flowing gas mixture which contains silicon in a volatile compound and which furthermore contains hydrogen.

3,851,472

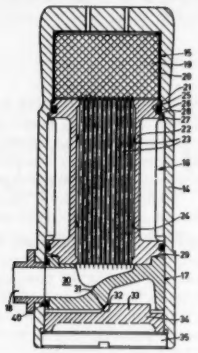
HOT-GAS ENGINE

Gregorius Theodorus Maria Neelen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 273,342, July 19, 1972, abandoned. This application Sept. 4, 1973, Ser. No. 393,987
Claims priority, application Denmark, Aug. 28, 1971, 11887/71
Int. Cl. F25b *9/00*
U.S. Cl. 60—517 **4 Claims**

1. A hot-gas engine comprising a variable space of higher average temperature which communicates with a variable space of lower average temperature, the communication between said spaces comprising a heater and a number of cooler-regenerator units each comprising a housing in which a regenerator, a cooler and a flow guide are present, the housing communicating, on the regenerator side, with the heater and, on the flow guide side, with the space of lower average temperature, characterized in that the regenerator, the cooler and the flow guide are connected together by soldered joints, an O-ring seal being present between the cooler and the housing and being incorporated in a groove in the cooler housing, said groove being bounded, on its side facing the flow guide, by a surface of the cooler which engages a surface present on the housing, an O-ring seal being also present at the area of the communication of the flow guide with the side wall of the housing, the flow guide comprising, on its side facing the

cooler, an edge which co-operates with an oblique surface of a cam which forms part of a sliding member which is axially



movable in the housing and which engages, on its side facing the flow guide, a pressure nut screwed into the housing.

3,851,473

BRAKE APPLICATION CONTROL DEVICES

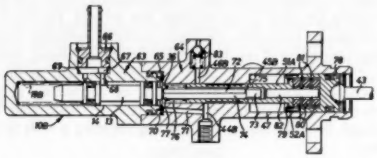
Wilfred Nicholas Bainbridge; David Parsons, and Harold Hodkinson, all of Leamington Spa, England, assignors to Automotive Products Company Limited, Leamington Spa, England

Filed June 7, 1973, Ser. No. 367,781

Claims priority, application Great Britain, June 9, 1972, 27036/72

Int. Cl. F15b *7/00*

U.S. Cl. 60—552 **8 Claims**



1. A master cylinder device comprising a body, a bore in the body, a freely floating master cylinder piston in the bore, and control valve means arranged to apply fluid under pressure from a remote fluid pressure supply source to the master cylinder piston to move the master cylinder piston within the bore, wherein the control valve means include a valve spool slidable in the bore, first second and third ports in the wall of the bore, and a space in the bore between the valve spool and the piston, the valve spool being arranged to place the first port in communication with a selected one of the second and third ports dependent upon the position of the valve spool within the bore, the first port also being in communication with said space, said valve spool being tubular with a through bore, with a rod in said through bore, first resilient means urging the tubular valve spool away from the master cylinder piston and second resilient means arranged so that brake applying movement is imparted to the rod and is imparted to said valve spool via said second resilient means and, if fluid pressure is not available in said space to move said master cylinder piston, said rod imparts brake applying movement to the piston.

3,851,474

STEAM TURBINE POWER PLANT, MORE PARTICULARLY ATOMIC POWER STATION

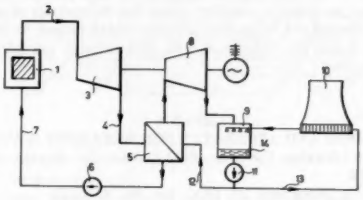
Laszlo Heller; Laszlo Forgo, and Arpad Bakay, all of Budapest, Hungary, assignors to TRANSELEKTRO Magyar Villamossagi Kulkereskedelmi Vallalat, Budapest, Hungary

Filed Oct. 27, 1972, Ser. No. 301,684

Claims priority, application Hungary, Oct. 27, 1971, EE 1966

Int. Cl. F01k *17/06, 23/02*

U.S. Cl. 60—644 **2 Claims**



1. A steam turbine power plant, wherein water is converted to steam at high pressure by nuclear energy comprising steam-generating means for utilizing said nuclear energy for said conversion, a high-pressure stage turbine, the outlet of said steam generating means being connected to the inlet of said high pressure stage turbine, a steam transformer having a primary side and a secondary side, the inlet of said primary side being connected to the outlet of said high pressure stage turbine, first pump means connected for transferring condensate from said primary side to the inlet of said steam-generating means, a low-pressure stage turbine connected at its inlet to the outlet of said secondary side, a mixing condenser connected at an inlet to the outlet of said low-pressure stage turbine, a dry cooling tower connected to said mixing condenser for providing cooled water thereto, and second pump means connected to the outlet of said mixing condenser for recycling condensate from said mixing condenser to the inlet of the secondary side of said steam transformer and for recycling of warmed cooling water to said cooling tower, whereby the passing of radioactive water through said cooling tower may be avoided.

3,851,475

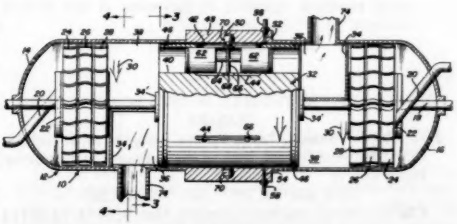
COMBINED TURBINE AND RECIPROCATING PISTON ENGINE

Douglas E. Ericson, 1192 Mojave, and Clyde A. Hawley, Rt. 4, Box 214, both of Idaho Falls, Idaho 83401

Filed Oct. 10, 1973, Ser. No. 405,006

Int. Cl. F01b *21/04*

U.S. Cl. 60—715 **10 Claims**



1. In combination, an elongated housing, a power shaft journaled longitudinally in said housing, turbine wheel means mounted on the opposite end portions of said shaft within said

housing, a cylinder drum mounted on said shaft between and spaced from said turbine wheel means, a plurality of piston bore formed through said drum spaced outwardly from and about said shaft and paralleling the latter, a double-ended piston assembly reciprocal in ecah of said bores and drivingly connected to said housing for rotating said drum in response to reciprocation relative to the latter, the spacing between the opposite ends of said drum and said turbine wheel means including stationary opposite end exhaust gas plenum means opening outwardly to the exterior of said housing and with which the remote ends of the bores disposed on opposite sides of a diametric plane of said drum are registered, at least a portion of said spacing not occupied by said plenum means defining gas transfer chamber means for the transfer of gases being discharged from said turbine wheel means to those piston bores not registered with said exhaust gas plenum means.

3,851,476

METHOD AND APPARATUS FOR BREAKING WAVES

Morgan Llewellyn Edwards, 5933 Corsica Dr., Dayton, Ohio 45424

Filed Nov. 29, 1972, Ser. No. 310,422
Int. Cl. E02b *3/04*
U.S. Cl. 61—1 R **5 Claims**

1. In a method of controlling waves by causing breaking thereof utilizing apparatus having a base, a platform mounted on said base, and means for moving said platform toward and away from said base, the steps comprising:

a. disposing said apparatus in a body of water at a location therein where breaking of waves is desired,

b. maintaining said base and an edge of said platform located nearest to approaching waves at a depth beneath the surface of the water greater than 1.3 times the height of approaching waves to place said base and said edge of said platform in a position relative to incoming waves such that siad base and said platform are subjected to relatively small wave forces,

c. positioning an edge of said platform opposite said edge thereof located nearest to approaching waves at a depth beneath the surface of the water approximately equal to 1.3 times the height of waves passing thereover to cause breaking of the waves by inducing them to use up their energy acting against themselves in chaotic turbulence,

d. monitoring breaking of said waves at said desired location, and

e. maintaining said opposite edge of said platform beneath the surface of the water at a depth approximately equal to 1.3 times the height of waves passing thereover to cause continual breaking of the waves at said desired location.

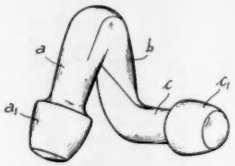
3,851,477

DEVICE FOR PROTECTING WORKS AGAINST LIQUID MASSES

Jean Claude Romain, Paris, France, assignor to Michel Lecourt; Bernard Grenot, both of Paris, France and Projetud, Paris, France

Filed Jan. 31, 1973, Ser. No. 328,283
Claims priority, application France, Mar. 9, 1972, 72.08174
Int. Cl. E02b *3/12*
U.S. Cl. 61—4 **4 Claims**

1. A block for protecting floating or fixed works such as piers, seawalls, jetties and the like against action of moving liquid masses, which comprises a pair of convergent elongated elements which are connected together only at their ends in an inverted V-formation, the second end of one of said elements being free, a complementary elongated member connected at one end only to the second end of the other of said



convergent elements and extending laterally therefrom in one direction only in position to act in cooperation with said free end of said one element to seat the composite block on an underlying supporting surface, said pair of elements providing an open area sufficient to receive the complementary member of an identical block in interengaging adjacent relationship.

3,851,478

METHODS OF CONTROLLING THE FLOW OF GASES UNDERGROUND

Douglas J. Ayres, London, England, assignor to British Railways Board, London, England

Filed June 5, 1972, Ser. No. 259,975
Claims priority, application Great Britain, June 9, 1971, 19727/71
Int. Cl. A62c *3/02, 1/08;* **E02d** *27/00*
U.S. Cl. 61—35 **14 Claims**

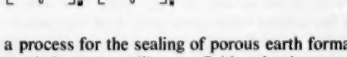
1. A method for controlling the flow of gases underground which comprises excavating at least one trench, applying a clay slurry to the area excavated in order to form a boundary wall surrounding an underground fire or surrounding an underground storage tank; said slurry being a mixture of clay and water in which the water predominates, permitting said slurry to impregnate large voids in the adjacent ground to render the adjacent ground substantially impermeable to air and thereby retarding the flow of air through the ground; placing a sheet of flame or corrosion resistant material selected from the group consisting of synthetic plastic material, metal, and fabricated board against at least one face of said at least one trench; and displacing clay slurry by depositing aggregate without cementing material into said at least one trench through the clay slurry and thereby forming a wall of aggregate.

3,851,479

SEALED POROUS EARTH FORMATIONS AND PROCESS FOR THEIR MANUFACTURE

Perry A. Argabright, Larkspur, and C. Travis Presley, Littleton, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Dec. 29, 1972, Ser. No. 317,884
Int. Cl. E02d *3/12*
U.S. Cl. 61—36 R **5 Claims**



1. In a process for the sealing of porous earth formations to reduce their permeability to fluids, the improvement comprising:

a. preparing an aqueous solution containing a water soluble salt of a polyisocyanuric acid and a water soluble polymer,

b. adjusting the pH of said aqueous solution as desired for a given application always having a pH in excess of 7,

c. applying said aqueous solution to said earth surfaces and maintaining contact between said earth surfaces and said aqueous solution for a time sufficient to permit gelation within the void space of said permeable earth surfaces.

3,851,480
MINE ROOF SUPPORT ASSEMBLIES

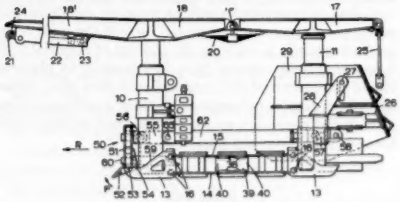
Franz Beulker, Werne a. d. Lippe; Kunibert Becker, Werl; Harry Rosenberg, Ludinghausen; Hans-Dieter Wieblitz, Dulmen, all of Germany, and Joseph Kuti, Charleston, W. Va., assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Westfalia, Germany

Filed May 9, 1973, Ser. No. 358,558

Claims priority, application Germany, May 10, 1972, 2222801

Int. Cl. E21d *15/44*

U.S. Cl. 61—45 D **16 Claims**



1. In a mine roof support assembly composed of relatively displaceable frames, each frame having telescopic props supporting a roof cap and resilient means interconnecting the bases of the props, and guiding and shifting means operably disposed between adjacent pairs of frames for effecting relative displacement of the frames and the improvement comprising a plurality of connection units provided on the resilient means of each frame and spaced apart longitudinally thereof and in the direction of said relative displacement, each connection unit enabling connection to be made between the resilient means and the associated guiding and shifting means with each guiding and shifting means being connected to selected ones of the connection units of the adjacent pair of frames.

3,851,481
MULTI-PURPOSE VEHICLE FOR USE UNDERGROUND

Jon R. Swoager, Imperial, Pa., assignor to Automation Equipment, Inc., Imperial, Pa.

Division of Ser. No. 299,354, Oct. 20, 1972, Pat. No. 3,811,290, which is a continuation-in-part of Ser. No. 241,975, April 7, 1972, Pat. No. 3,793,966. This application Oct. 16, 1973, Ser. No. 406,971

Int. Cl. E21d *15/44*

U.S. Cl. 61—45 D **1 Claim**

1. A self-propelled vehicle for use in underground excavations having a floor and a ceiling, said vehicle comprising:

a frame;

wheel assemblies supporting said frame, said wheel assemblies being independently suspended and steerable;

a body supported on said frame;

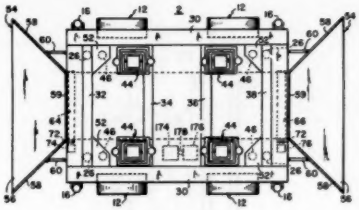
first lifting means supported by said frame for raising said body above said frame;

a plurality of rotatable chuck assemblies disposed within said body and adapted to engage a workpiece for insertion into said ceiling;

second lifting means supported by said body and engaging said chuck assemblies for raising said chuck assemblies above said body;

a pair of movable scoop containers mounted on said frame at opposite ends thereof;

a reversible conveyor supported by said frame and positioned to transport material from one of said containers



to the other; and

means mounted on said frame for contacting said ceiling above said vehicle and said floor below to support said ceiling against collapse.

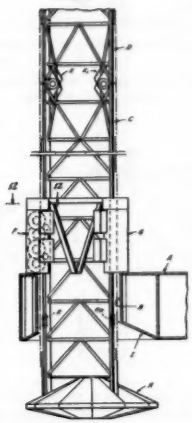
3,851,482
SECTIONALIZED LEG FOR DRILLING PLATFORM AND METHOD OF ASSEMBLING SAME

Richard L. LeTourneau, and Chester G. Hall, both of Longview, Tex., assignors to IHC Holland-Le Tourneau Marine Corporation, Kilgore, Tex.

Filed May 25, 1973, Ser. No. 363,987

Int. Cl. E02b *17/00*

U.S. Cl. 61—46.5 **11 Claims**

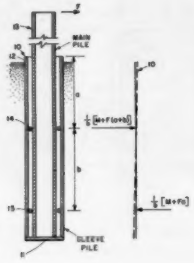


1. A leg structure for a jack-up-type drilling platform comprising a plurality of aligned, longitudinally and laterally separable sections, lifting and lowering means on abutting leg sections, and separable joint means on said abutting sections capable of securing said abutting sections in alignment with said lifting and lowering means in accurately timed relationship.

3,851,483
SLEEVED-PILE STRUCTURE

Myle J. Holley, Jr., 1364 Massachusetts Ave., Lexington, Mass. 02173

Filed Dec. 12, 1972, Ser. No. 314,481
Int. Cl. E02d 5/22; E02b 17/00
U.S. Cl. 61—53 22 Claims



1. A structural assembly comprising in combination
a pile;
a sleeve surrounding a longitudinal portion of said pile;
force transfer means interconnecting said sleeve internally to said pile at one or more selected locations along their common length; and
means for preventing soil from entering the interior space between said pile and sleeve above said force transfer means and occupying this space when said pile and sleeve are embedded in a soil region.

3,851,484
APPARATUS FOR INSTALLING CONCRETE PILES

Jerry A. Steding, 4605 Meadow Valley Dr. N.E., Atlanta, Ga. 30342

Filed Apr. 14, 1972, Ser. No. 244,118
Int. Cl. E02d 5/34
U.S. Cl. 61—53.52 1 Claim

1. Apparatus for use in forming a column of material such as a support pile, sand drain or well point means, in situ, comprising:
a. container means having funnel-shaped sides converging to define a ground-engaging opening adjacent the container bottom, being operable for supporting a quantity of column forming material with said funnel-shaped sides detailed for directing said column forming material by gravity outwardly through said container bottom opening;
b. a column forming plow point means adapted initially to be located in said container adjacent said bottom opening, said column plow point means having a lower end of a given cross sectional area and an upstanding socket portion of exterior cross section less than that of said lower end and presenting a vertical bore of substantial length adapted to fit closely around the lower end of a pusher member to aid in guiding said lead member in a plumb direction, said lower end of the plow point means being slightly less in cross-section than the cross-sectional area of said container bottom opening;
c. an elongated pusher means having its lower end closely fitted with said socket portion of said plow point means so that an impact force applied to said pusher means will be transferred to said plow point means for effecting penetration of the soil supporting surface to cause a vertically continuous column bore to be formed in said soil, said pusher means being of cross sectional area substantially less than that of said lower end of the plow point means; and,
d. said container including scale means for progressively indicating the amount of column forming material transferred into a column being formed and said pusher means including a graduated scale to indicate depth of plow point penetration and in conjunction with the scale means on the container to indicate the amount of material transferred into said column bore in response to predetermined increments of movement of said plow point means, whereby it may be determined whether a uniform amount of material necessary to fill the theoretical bore size is being induced into the bore.

3,851,485
METHOD AND APPARATUS FOR INSTALLING CONCRETE PILES

Jerry A. Steding, 4605 Meadow Valley Dr. N.E., Atlanta, Ga. 30342

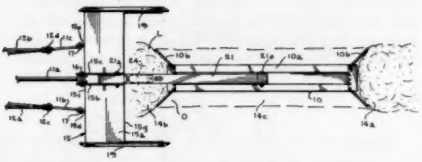
Continuation-in-part of Ser. No. 244,118, April 14, 1972,. This application Nov. 29, 1972, Ser. No. 310,465
Int. Cl. E02d 5/34, 13/04
U.S. Cl. 61—53.52 32 Claims

15. A method of forming in the earth's surface a support column, such as a pile, of a fill material that may be introduced into the column cavity in a fluid condition and which becomes solid after curing including the steps of:
a. forming a cavity of selected size and depth in the earth's surface;
b. selectively introducing a predetermined volume of fill material into said cavity by gravity; and
c. forming a fracture plane at a selected elevation in the upper extremity of the column by the introduction of a break-off plate at the selected elevation.

3,851,486
GATE SETTING DEVICE

John Everett Anderson, P.O. Box 812, Eagle Lake, Tex. 77434

Filed July 30, 1973, Ser. No. 383,916
Int. Cl. E02b 7/20; E02f 5/16
U.S. Cl. 61—63 7 Claims



1. Apparatus for use in conjunction with a tractor including a tractor mounted lift means, for placing a gate frame in a levee, comprising:

a main frame section;

connect means connecting said main frame section for pivotal movement with said tractor lift means;

said main frame section including earth moving means cooperating with said tractor lift means for forming an opening in a levee by movement of said tractor along said levee; and

gate setting means mounted with said main frame section for setting a gate frame into the ground of said opening in said levee, including:

a power arm mounting with said main frame section for pivotal movement with respect thereto,

shoe means pivotally attached to said power arm for engaging said gate frame; and

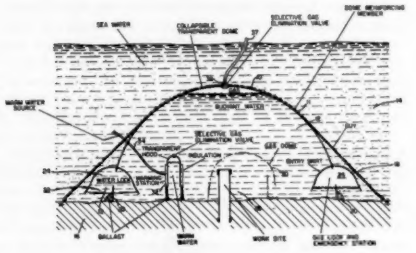
power means connected to said power arm and to said frame section for moving said shoe means downwardly into engagement with said gate frame and for pressing said gate frame into the ground of said opening; and

mount means mounting said shoe means for pivotal movement substantially parallel to said levee only.

3,851,487
BUOYANT UNDERWATER STRUCTURES

Christian J. Lambertsen, 217 Glen Rd., Ardmore, Pa. 19003

Filed Oct. 6, 1970, Ser. No. 78,493
Int. Cl. B63c 11/00
U.S. Cl. 61—69 R 16 Claims

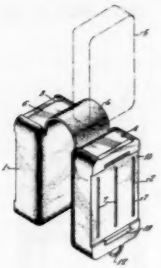


1. Buoyant structure, totally submerged in an underwater environment, comprised of a shell substantially impermeable to water, said shell having access openings therein, the volume within such shell being occupied by water having a lower specific gravity than that of the underwater environment, said shell being closed at the top and sides thereof.

3,851,488
DIVERS WEIGHT

Manfred Schuler, 4100 Patrice Rd., Newport Beach, Calif. 92660

Filed Feb. 22, 1973, Ser. No. 334,696
Int. Cl. B63c 11/30
U.S. Cl. 61—70 4 Claims



1. A diving weight apparatus comprising:

a first case having an opening adapted to receive a first weight;

means for securing said first case to a diving belt;

a second case having an opening adapted to receive a second weight;

means for securing said first and second cases together;

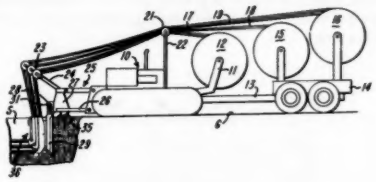
means for securing the first weight within said first case and the second weight within said second case, and wherein said means for securing the first and second weights within said first and second cases and said means for securing said cases together comprise:

a flexible hinge connecting said first and second cases together at a point adjacent to the weight receiving openings, said hinge to have a strap length commensurate with the total width of both cases.

3,851,489
LINE LAYING APPARATUS

Kenneth Richardson, 111 W. First St., Bldg. Suite 512, Vandalia, Ohio 45402

Filed June 28, 1973, Ser. No. 374,340
Int. Cl. F16l 1/00
U.S. Cl. 61—72.6 12 Claims

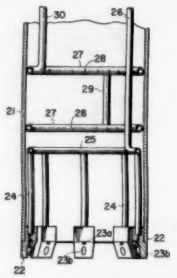


1. A line guide for use in a line layer providing a blade adapted to mount a line guide in a connected following relation to said blade, comprising means defining a plurality of separate line guide passages, said means including a base guide and plural guide elements in an aligned conforming relation, said elements being separably related with one contained relative the other on a superposed positioning thereof and including means providing for relative displacement of said plural guide elements whereby to provide for a modification of said passages and access to said passages as and when needs require.

3,851,490
CONSTRUCTION PILE HAVING FLUID INJECTION MEANS

Kunijiro Matsushita, Toyokawa, Japan, assignor to Kumagai Gumi Company Limited, Fukui-shi, Japan

Filed Apr. 4, 1973, Ser. No. 347,977
Claims priority, application Japan, July 28, 1972, 47-76256
Int. Cl. E02d 7/24; E21b 7/18
U.S. Cl. 61—53.74 **2 Claims**



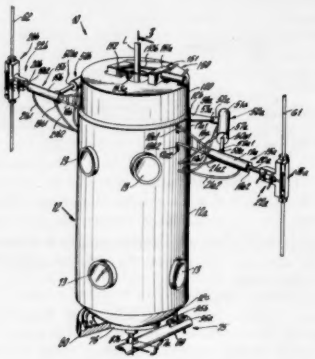
1. A construction pile comprising a hollow cylindrical body; first water spray nozzle means provided at the bottom end of said body and including a plurality of nozzle fittings disposed along the whole periphery of said bottom end, each of said nozzle fittings having a radially inwardly directed nozzle opening and an axially downwardly directed nozzle opening; a water supply means for supplying pressurized water to said first nozzle means including a common manifold ring disposed within said body at the upper side of said nozzle fittings, a plurality of water pipes for connecting said manifold ring with said nozzle fittings respectively, and a water conduit for connecting said manifold ring with a suitable source of pressurized water on the ground; an air nozzle means provided within said body and including at least one tubular ring disposed adjacent the cylindrical inner surface thereof and connected together with the adjacent one by a conduit, each of said rings having a plurality of radially inwardly directed nozzle openings disposed along the whole range of said ring and at angularly spaced relationships; and an air supply conduit passing through said body and connecting the uppermost positioned tubular ring to a source of pressurized air for introducing said pressurized air to said nozzle openings of said upper and lower tubular rings.

3,851,491
METHOD AND APPARATUS FOR UNDERWATER OPERATIONS

Burton H. Mason, Covington, La., assignor to Atmospheric Diving Systems, Inc.

Filed June 22, 1972, Ser. No. 265,295
Int. Cl. B63c 11/40
U.S. Cl. 61—69 R **52 Claims**

1. An apparatus for carrying out an operation at an underwater area, said apparatus comprising a submergible chamber, arm means interconnected thereto and extending outwardly therefrom, gripping means attachably mounted to said arm means at the outward end thereof, said gripping means being adaptably formed to grip vertically disposed guides, means to actuate said gripping means, whereby said chamber is submergible to a depth whereat said gripping means is actuated

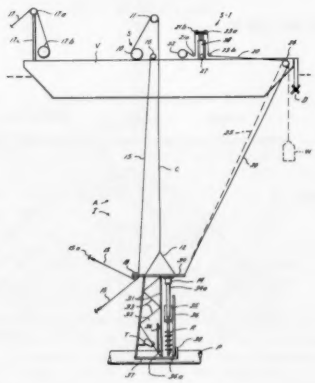


to grip said guides so as to hold said chamber at said depth adjacent said area.

3,851,492
APPARATUS AND METHOD FOR OFFSHORE OPERATIONS

Glyn E. Cannon; James R. Kruger; Theodore A. Short, and Benjamin L. Jobe, all of Houston, Tex., assignors to Seascope Services, Inc., Houston, Tex.

Continuation of Ser. No. 184,728, Sept. 29, 1971, abandoned.
This application May 18, 1973, Ser. No. 361,810
Int. Cl. F16l 1/00
U.S. Cl. 61—69 R **20 Claims**



1. A method of anchoring a submarine pipeline beneath a body of water, comprising the steps of:

lowering a work platform from a transporting marine vessel to a submerged position adjacent the pipeline;

anchoring the pipeline with the earthen floor beneath the body of water;

automatically controlling relative movement between the work platform and the pipeline during anchoring; and

said step of controlling relative movement including:

a. sensing the position of the work platform relative to the pipeline; and

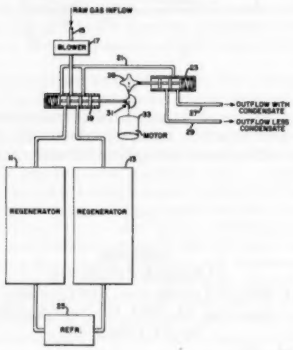
b. limiting movement of the work platform with respect to the pipeline in accordance with the results of said step of sensing, whereby a stable anchoring operation independent of transporting vessel movement may be performed.

3,851,493

GAS SEPARATION AND PURIFICATION UTILIZING TIME SEQUENCED FLOW THROUGH A PAIR OF REGENERATORS

William E. Gifford, Syracuse, and Enrico D. Veltri, East Syracuse, N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Sept. 5, 1972, Ser. No. 286,166
Int. Cl. F25j *5/00*
U.S. Cl. 62—13 **9 Claims**



1. The process of separating from a starting gas mixture a constituent gas characterized by a saturation temperature relatively higher than other constituent gases of the mixture, comprising the steps of:

a. passing said gas mixture through a thermal regenerator from the warm end toward the cold end thereof at pressure and temperature levels such that the gas mixture is cooled below the dew point of said high saturation temperature gas thereby causing at least a substantial part thereof to condense out and deposit in said regenerator;

b. reducing the temperature level of the gas as passed through said regenerator;

c. passing said gas at reduced temperature level through a thermal regenerator from the cold end toward the warm end thereof to thereby vaporize previously deposited condensate into the gas stream initially at concentrations substantially higher than in the starting gas mixture and as the condensate deposits are removed then in concentrations substantially lower than in said starting gas mixture; and

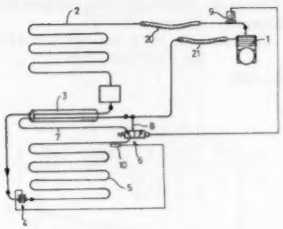
d. dividing the regenerator outflow into separate time sequential portions of which the first includes said high saturation temperature gas in relatively high concentration and the second includes said high saturation temperature gas in substantially lower concentration, and passing said first and second time sequential portions of the regenerator outflow to separate points of use or discard.

3,851,494

MOTOR VEHICLE COOLING SYSTEM WITH BYPASS REGULATED HEAT EXCHANGER

Jurgen Hess, Markgroningen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed July 9, 1973, Ser. No. 377,765
Claims priority, application Germany, Aug. 10, 1972, 2239297
Int. Cl. F25b *41/00*
U.S. Cl. 62—196 **5 Claims**



1. A cooling system particularly suitable for a motor vehicle, comprising a compressor, a condenser, a heat exchanger for further cooling of the liquidified refrigerant, an expansion valve and an evaporator arranged for continuously cycling the refrigerant, wherein:

said heat exchanger is arranged to cool said liquid refrigerant by warming cooled vapor from said evaporator before it is supplied to said compressor, and

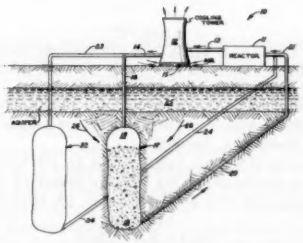
automatically regulated bypass means are provided for reducing the temperature of the vapor provided to said compressor in response to thermostatic means responsive to the temperature of the refrigerant output of said compressor, and thereby to prevent the output of said compressor from reaching a temperature damaging to organic compounds exposed to the refrigerant of the system.

3,851,495

METHOD AND APPARATUS FOR PREVENTING THERMAL POLLUTION

Joseph A. Lahoud, and Dennis L. Orphal, both of Las Vegas, Nev., assignors to Computer Sciences Corporation, Los Angeles, Calif.

Filed Oct. 5, 1971, Ser. No. 186,708
Int. Cl. F25d *23/12*
U.S. Cl. 62—260 **9 Claims**



1. In a method of preventing thermal pollution of water resources from industrial facilities which require substantial cooling and wherein cooling water is circulated from said industrial facility to a cooling unit for removing substantial heat energy therefrom and back to said industrial facility for reuse, the improvement comprising,

1. forming a large underground water reservoir by a nuclear

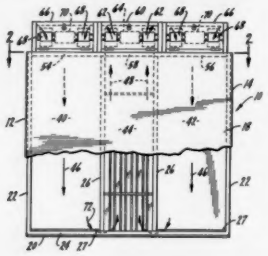
explosion such that said reservoir has a greater vertical dimension than horizontal dimension,
2. connecting the upper level of said underground reservoir to said cooling unit to receive water therefrom,
3. connecting the lower end of said reservoir to said industrial facility to deliver cooled water therefrom,
4. whereby excess heat energy remaining in the water issuing from said cooling unit is dissipated in the earth.

3,851,496

AC-DC PLATE REFRIGERATION AIR SYSTEM

Donald N. Rupert, Jr., Pittsburgh, Pa., assignor to Dole Refrigerating Company, Chicago, Ill.

Filed Jan. 22, 1974, Ser. No. 435,427
Int. Cl. F25d *17/04*
U.S. Cl. 62—406 **6 Claims**



1. In a vehicle eutectic plate refrigeration system, a cover, at least one eutectic plate positioned within said cover, said cover being closed on the bottom, sides, front and rear, a plurality of air openings at the top of said cover, air passage means within said cover and associated with said plate defining air passages which extend from one of said openings, down along a portion of the plate to the bottom of the plate, and then upwardly along a different portion of the plate to another one of said openings, DC air moving means positioned at one of said air openings, which opening functions as an air discharge when said DC means is operated to move air through said air passages, and AC air moving means associated with another one of said air openings, which opening functions as an air discharge when said AC means is operated to move air through said air passages, the opening associated with said DC air moving means functioning as an air inlet when said AC means is operated and the opening associated with said AC means functioning as an air inlet when said Dc means is operated.

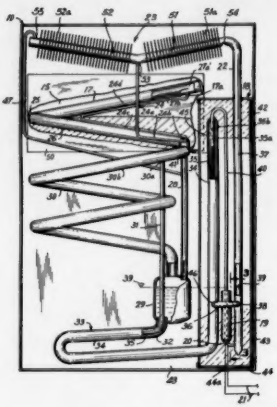
3,851,497

TILTABLE AIR-COOLED ABSORPTION REFRIGERATION APPARATUS OF THE INERT GAS TYPE

Peter Erik Blomberg, Stockholm, and Karl Gunnar Boren, Skarholmen, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Continuation of Ser. No. 335,534, Feb. 26, 1973, abandoned, which is a division of Ser. No. 235,367, March 16, 1972, Pat. No. 3,802,219. This application Nov. 29, 1973, Ser. No. 419,920
Int. Cl. F25b *15/10*
U.S. Cl. 62—452 **16 Claims**

1. A refrigerator comprising
a. structure providing a cabinet having a thermally insulated storage compartment,
b. absorption refrigeration apparatus of the inert gas type including a condenser positioned in a space at the rear of said cabinet which is external to said compartment,
c. said condenser comprising at lesat one pair of hollow members which slope upward and are united at their lower ends and form an angle therebetween,
d. said hollow members having an inlet for refrigerant at one level and an outlet for refrigerant at a lower level at the



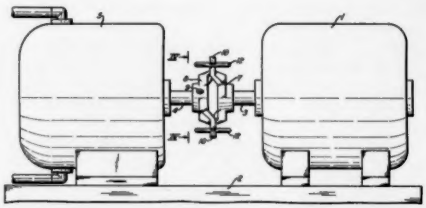
region said members are united to one another, and
e. said pair of hollow members substantially bridging the space at the rear of said cabinet between the lateral sides thereof.

3,851,498

FLEXIBLE COUPLING

Sherman L. Rice, 511 Azalea Ave., East Liverpool, Ohio 43920

Filed May 22, 1973, Ser. No. 362,809
Int. Cl. F16d *3/62*
U.S. Cl. 64—12 **8 Claims**

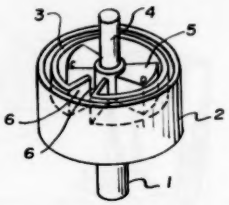


1. A flexible coupling for a pair of aligned rotatable shafts, comprising a pair of separate arms crossing each other and provided centrally with means for rigidly mounting them on the adjacent ends of the shafts, and a pair of resilient O-rings connecting the ends of one arm to the ends of the other arm, the arms being shaped to hold said rings in place in substantially parallel planes substantially parallel to the axis of rotation of the arms, whereby when one of the arms is rotated by a shaft to put the rings under tension the rings will cause the other arm to rotate in the same direction.

3,851,499
DRIVING MECHANISM FOR A LOAD WITH INERTIA

Masaru Noguchi, Tokyo, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

Filed Mar. 21, 1973, Ser. No. 343,353
Int. Cl. F16d 3/14
U.S. Cl. 64—27 S 4 Claims



1. Apparatus for applying rotational driving torque to a load including in combination:

a rotational load having predetermined inertia and presenting a first greater driving torque as said load is brought to an opening speed, and requiring a second lesser driving torque to maintain rotation of said load at the operating speed;

a synchronous motor having an output shaft and capable of producing said second driving torque at its synchronous operating speed, said motor being incapable of producing said first greater driving torque at a speed below its synchronous speed and failing to rotate when a load requiring such greater torque is applied; and

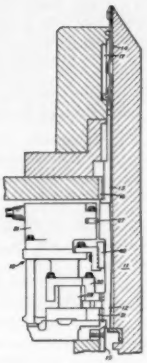
a slip torque clutch having a hollow cylindrical clutch drum and a clutch spring in engagement with the inner surface of said clutch drum, said spring resiliently urged outwardly into frictional contact with the inner surface of said drum for rotation therewith and including at least one projection thereon, a clutch shaft aligned with the axis of said clutch drum and carrying therewith a lever for engagement with said projection, said clutch drum connected for rotation with one of the output shafts of said motor and said rotational load and said clutch shaft connected with the other of the output shaft of said motor and said rotational load, and wherein the torque at which said clutch slips is selected to be less than the first greater driving torque which would prevent said synchronous motor from rotating upon initial energization.

3,851,500
CIRCULAR KNITTING MACHINE NEEDLE SELECTING APPARATUS

Ronald G. Wolfshagen, Fullerton, Calif., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 19, 1971, Ser. No. 135,319
Int. Cl. D04b 15/78
U.S. Cl. 66—50 R 12 Claims

1. Actuator apparatus for selectively effecting positioning of needle jacks mounted within the tricks of the needle cylinder of a circular knitting machine to place the jacks in either a selected or a non-selected position, as desired, said apparatus comprising a magnetic static force assembly including cam means adapted for physical engagement with one end of each of the jacks to place the jack in the selected position in which the each associated needle carried in the needle cylinder will be caused not to knit, magnetic means for holding said one end of each jack in contact with said cam means, and magnetic force translation assembly means including a plurality of electromagnets physically arranged in a predetermined manner to enable them selectively to magnetically engage the other end of each selected jack with sequentially applied magnetic fields overcoming said magnetic means of said static

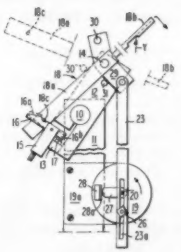


force assembly means to hold the selected jack in the selected position where the associated needle will be caused to knit.

3,851,501
STOP MOTION APPARATUS FOR KNITTING MACHINES

Nathan Levin, 416 Highgate Dr., Trenton, N.J. 08618, and Thomas Anderson Oliver, Jr., 319 Summit Ave., Jenkintown, Pa.

Filed Oct. 2, 1973, Ser. No. 402,734
Int. Cl. D04b 35/12
U.S. Cl. 66—163 10 Claims



1. Electrically operated circuit to control the operations of apparatus of the type used with a knitting machine to automatically stop and to automatically re-start the operation of the same, said machine having at least one yarn fed thereto when it is in operation and said apparatus having an arm to so feed said yarn, said machine having an electrically operated stop motion system and stop motion devices by means of which the operation of said machine is stopped when said system is actuated by said devices, said machine also having an electrically operated starting circuit by means of which the machine is placed in operation when said starting circuit is energized, said control circuit being connected to said stop motion system to also actuate the latter to stop the operation of said machine, said control circuit also being connected to said starting circuit to energize the latter to place said machine in operation, said arm being movable back and forth between first and second positions thereof and being operable in its said second position to cause said control circuit to actuate said stop motion system to stop the operation of said machine,

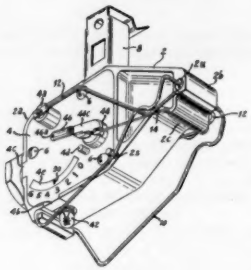
said apparatus having means to apply force to said arm to move the same from its said second position thereby to re-set the same in its said first position, said arm in its said first position feeding said yarn to said machine when the latter is in operation and being movable therefrom by said yarn to its said second position when said yarn is excessively tensioned, said arm thereby causing said control circuit to actuate said stop motion system to stop the operation of said machine and the feeding of said yarn thereto, said control circuit then causing said apparatus to automatically re-set said arm and then to energize said starting circuit to automatically re-start the operation of said machine.

3,851,502

YARN DETECTOR SWITCH-UPPER

Alton W. Hopkins, Newtown Square, Pa., assignor to Control Switch, Inc., Folcroft, Pa.

Filed Mar. 5, 1973, Ser. No. 337,924
Int. Cl. D04b *35/14*
U.S. Cl. 66—163 **12 Claims**



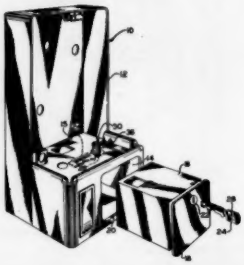
1. A yarn detector device comprising:
an insulating housing;
a pair of electrical terminals on said housing;
a toggle spring mechanism comprising an overcenter spring biased crank shaft in said housing with the opposite ends of said crank shaft extending out through opposite walls of said housing;
means providing an eye for passage of yarn comprising:
an external guide member supported on said housing and providing one side of said eye;
and an external trip member supported on said crank shaft and biased toward said guide member by said toggle spring mechanism to provide the other side of said eye through which the yarn passes, and being responsive to undue tension in the yarn or a snag to trip across the line of action of said toggle spring mechanism thereby to open said eye and release the yarn therefrom;
a switch within said housing;
switch operating means accessible externally of said housing;
an external feeler member supported on said switch operating means and normally engaging the yarn adjacent said eye and being movable upon release of the yarn or in case of undue slack, break or end of yarn to operate said switch to close an electrical circuit between said terminals for stop motion purposes;
and quick disconnect joints between said external guide member and said housing and between the aforementioned external trip and feeler members and their respective supporting crank shaft and switch operating means enabling ready replacement of the wear parts.

3,851,503

SECURITY SYSTEM FOR SECURING AN ARTICLE AGAINST UNAUTHORIZED REMOVAL

Paul A. Trimmer, 25 Hamilton Ave., Berkeley Heights, N.J. 07922, and Fred M. Cirule, 29 Summit Rd., Parsippany, N.J. 07054

Filed June 20, 1973, Ser. No. 371,616
Int. Cl. E05b *73/00*
U.S. Cl. 70—58 **21 Claims**

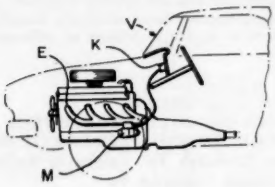


1. A security system for use in connection with a coin-operated apparatus in which a coin compartment in the apparatus housing is locked with a key and the housing is provided with a screw-threaded stud, said system securing the key to the housing against unauthorized removal, said security comprising:
a fastener member having a body with an axially extending screw-threaded aperture engageable with said stud and an axially extending portion with a radial surface and an outer peripheral surface portion including a radial shoulder;
a collar having a bore generally complementary to the outer peripheral surface portion of the axially extending portion of the fastener member body for receiving said axially extending portion in free-spinning relationship therewith and enveloping said outer peripheral surface portion while leaving said radial surface exposed, said bore including a radial ledge complementary to the radial shoulder of the fastener member body, and said collar having an outer peripheral surface including a circumferential recess therein;
means for capturing the key upon the housing when the fastener member is affixed to the housing by engagement of the screw-threaded aperture with the screw-threaded stud, with the collar enveloping the outer peripheral surface portion of the fastener member body;
a driving mechanism for selectively affixing and releasing the fastener member from the housing, said driving mechanism including
a gripping member having a jaw for engaging the recess of said collar; and
an actuator mounted upon the gripping member for axial movement relative thereto, said actuator having abutment means for engaging the radial surface of the fastener member such that upon engagement of the abutment means with the radial surface and engagement of the jaw of the gripping member with the recess of the collar, subsequent relative axial movement of the actuator and the gripping member will urge the jaw against the recess to frictionally couple the collar with the driving mechanism and will urge the radial ledge against the radial shoulder to frictionally couple the collar with the fastener member thereby permitting rotation of the fastener member in response to rotation of the driving mechanism.

3,851,504
COMBINATION LOCK FOR ENGINE STARTERS

Eugene J. Theobald, 51 Forest Ave., Fort Thomas, Ky. 41075

Filed July 17, 1973, Ser. No. 380,121
Int. Cl. B60r 25/04; E05b 65/12
U.S. Cl. 70—255 7 Claims



1. A combination lock for a vehicle engine having a starter mechanism including a starter solenoid having a reciprocable plunger adapted to be drawn from an initial rest position to an engine-starting position when the solenoid winding is energized, the lock comprising:

a. a locking member supported by the starter solenoid and including a pawl, the member being moveable through multiple possible positions wherein the pawl interferes with reciprocation of the plunger into starting position and said multiple positions including one intermediate position in which the pawl frees the plunger to move into starting position;

b. spring means operative to bias the locking member and pawl away from said one position;

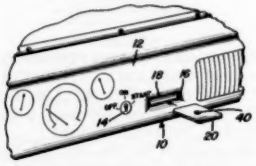
c. motor means operative to move through steps and coupled to move the locking member pawl through said multiple positions including said intermediate position, the motor means including an actuator coil for each step capable when energized of moving the motor means into the corresponding position, and the motor means having its position determined by said spring means when none of its coils is energized; and

d. keyboard means having multiple push buttons at least some of which are connected to energize the various motor coils, and the vehicle including means to energize the starter solenoid.

3,851,505
CARD HOLDER FOR VEHICLES

Lawrence H. Wilkinson, 718 Encino Pl., N.E., Albuquerque, N. Mex. 87106

Filed May 1, 1973, Ser. No. 356,079
Int. Cl. E05b 65/12
U.S. Cl. 70—255 4 Claims

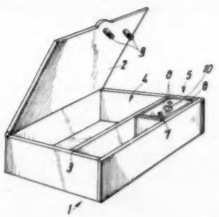


1. In combination, a mounting panel having a slot formed therein, a flat elongated hollow housing having at least one open end and a pair of opposing large plan area longitudinal side walls interconnected along corresponding longitudinal edges by a pair of opposing small plan area longitudinal side walls extending and secured therebetween, means supporting said housing from one side of said mounting panel with said one open end registered with said slot, whereby a card may be inserted into said slot from the other side of said mounting panel for at least substantial displacement of the first inserted end of said card into said housing, one of said large plan area side walls having an opening formed therethrough, an elongated locking pin plunger disposed generally normal to said one side wall, means supporting said pin plunger from said one side wall for lengthwise reciprocation of said pin through said opening between an extended position with said pin plunger projecting into the interior of said housing and a retracted position with said pin plunger retracted from the interior of said housing, means connected between said pin plunger and said one side wall yieldingly biasing said pin plunger toward its retracted position, a lever pivotally supported from the exterior of said one side wall for oscillation about an axis extending transversely of said lever intermediate its opposite ends and generally paralleling said one side wall, one end of said lever being disposed outwardly of and comprising an abutment defining the outer limit of movement of the outer end of said pin plunger, solenoid means carried by said one side wall and including a reciprocal actuator shiftable between extended and retracted positions and normally biased toward the extended position, said actuator including an operative connection with the other end of said lever to allow oscillation of the latter to a position permitting retraction of said pin plunger and to shift said lever to a position moving said pin plunger to the extended position therof upon deactivation of said solenoid means, said pin plunger, when in the extended position, being adapted to be received through a bore formed through a card positioned in said housing with the bore registered with said opening to lock said card in said housing against retraction therefrom.

3,851,506
CIGARETTE BOX

Heinz Simon, Huttenstrasse 32-34, 8950 Kaufbeuren-Neugablonz, Germany

Filed Dec. 29, 1972, Ser. No. 319,731
Claims priority, application Germany, Dec. 29, 1971, 2165380
Int. Cl. E05b 43/00
U.S. Cl. 70—271 1 Claim



1. A cigarette box having a body portion defining a storage space for smoker's articles and housing a timing device with a pin lock, and having a lid hinged to the body portion with at least one locking pin for engaging the timing device wherein the improvement comprises:

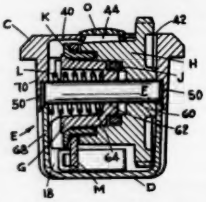
a presettable battery operated electronic control block having a time relay for causing said lid to be locked in its closed position for a predetermined interval of time;

at least one locking pin on said lid for engaging said battery operated electronic control block and actuating a time relay, said at least one locking pin defining a switching contact for initiating the actuation period of the time relay.

3,851,507
COMBINATION LOCK

Charles S. Gehrie, Montclair, N.J., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Clifton, N.J.

Filed May 14, 1973, Ser. No. 360,029
Int. Cl. E05b *65/52*
U.S. Cl. 70—316 **16 Claims**

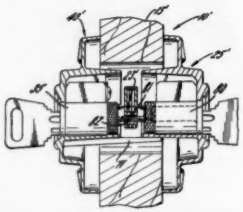


1. A combination lock comprising a plurality of longitudinally spaced assemblies, each assembly comprising a shaft, a non-rotatable ratchet member, a rotatable dial member having two series of teeth, a rotatable ratchet having two series of teeth, one series of teeth of the rotatable ratchet being cooperable with the non-rotatable ratchet member and the other series being cooperable with a series of teeth of the dial member, a sleeve having a series of teeth cooperable with the second series of teeth of the dial member, the sleeve having a radial slot, and a spring resiliently maintaining the non-rotatable ratchet member, dial member, ratchet and sleeve in assembled relationship, and a manually operable latching slide member mounted for movement perpendicularly to the longitudinal axis of each of said assembly shafts, the latching slide member having longitudinally spaced fingers adapted to be received in the radial slot of each sleeve when the fingers and slots are in alignment, a sleeve blocking movement of the slide member when a finger and a slot are out of alignment.

3,851,508
SINGLE AND DOUBLE CYLINDER DEADLOCKS

Donald L. McCurdy, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Jan. 22, 1973, Ser. No. 325,555
Int. Cl. E05b *9/08*
U.S. Cl. 70—370 **10 Claims**

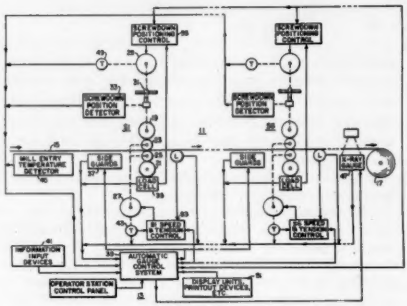


1. A deadlock having a latching bolt and a lock cylinder, key-operated mechanism connected between said cylinder and said bolt and operable when turned to move said bolt between latched and unlatched positions, the improvement in said deadlock comprising, a metal escutcheon having an inner side adapted to lie adjacent one face of a door and having a decorative outer side, a metal barrel projecting inwardly from the inner side of said escutcheon and adapted to telescope into an opening extending through the door, a hole extending through said barrel and sized to receive said cylinder, and a fastener for securing said cylinder to said barrel to anchor the cylinder within said hole, said fastener extending between said cylinder and said barrel and securing said cylinder to said barrel independently of the door, the inner end portion of said barrel being formed with first and second axially facing walls spaced angularly and axially from one another, apertures opening out of each of said walls, said fastener being threaded into the aperture in one of said walls and having a portion bearing against such wall and said cylinder to anchor the latter within said hole, said fastener being selectively threadable into the other aperture to anchor a cylinder of different length within said hole.

3,851,509
ROLLING MILL GAUGE CONTROL METHOD AND APPARATUS INCLUDING SPEED CORRECTION

Richard Q. Fox, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1972, Ser. No. 303,725
Int. Cl. B21b *37/00*
U.S. Cl. 72—8 **9 Claims**



1. A gauge control system for a rolling mill having at least one roll stand operative to reduce the gauge of a workpiece passed through said roll stand, said system comprising:

means for determining the delivery gauge error of said workpiece leaving said one roll stand of said rolling mill in accordance with the measured roll force of said one roll stand and a predetermined correction to said measured roll force, said predetermined correction being established in magnitude as a function of a change in speed of said one roll stand,

means operative in relation to said delivery gauge error for determining a required adjustment in the operation of said one roll stand to remove said gauge error, and

means for adjusting said one roll stand in accordance with said required adjustment.

3,851,510
METHOD AND APPARATUS FOR FINISHING A ROLLING BAR USING A DISPLACEABLE INTERMEDIATE STAND BETWEEN TWO END ROLL STANDS

Erich Reth, Duisburg-Buchholz, Germany, assignor to Demag Aktiengesellschaft, Duisburg, Germany

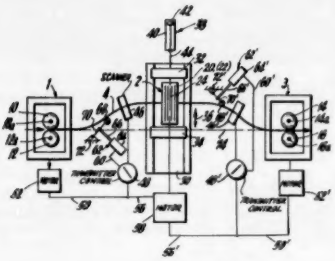
Continuation-in-part of Ser. No. 209,217, Dec. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 887,525, Dec. 23, 1969, abandoned. This application June 18, 1973, Ser. No. 370,625

Claims priority, application Germany, Feb. 18, 1969, 1908004

Int. Cl. B21b *31/02, 1/18*
U.S. Cl. 72—12 **13 Claims**

1. A method of tension-free finish rolling a long metal workpiece, such as a continuous bar, using spaced-apart finish roll

stands including cooperable roll pairs defining a nip therebetween through which the workpiece is fed, and deflecting the workpiece into a bulge or loop between successive finish roll stands to compensate for any difference in speed of the successive finish roll stands, comprising the steps of aligning a roll stand intermediate two roll stands, constituting end roll stands with respect to the intermediate roll stand, so that the nips of



the three roll stands are in alignment and feeding the workpieces between the nips of the three roll stands, and thereafter shifting the intermediate roll stand so that the nip of the rollers thereof is moved out of alignment with the nips of the rollers of the end roll stands in order to deflect the workpiece, between the end roll stands, to form a bulge of the workpiece between the two end roll stands while the rolling operation is continued.

3,851,511
METHOD FOR HYDROSTATIC EXTRUSION

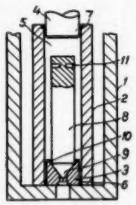
Bertil Aberg, Helsingborg, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Sept. 14, 1973, Ser. No. 397,303

Claims priority, application Sweden, Sept. 14, 1972, 11872/72

Int. Cl. B21c *31/00*

U.S. Cl. 72—60 **11 Claims**



1. Method for hydrostatic extrusion, which comprises enclosing a solid billet in a pressure chamber in an extrusion press, surrounding the billet by a pressure medium, raising the pressure in the pressure medium to such a level that the material in the billet, under the influence of the pressure medium, is pressed out through an opening in a die which gives a product of the desired cross-section, in which the billet at its rear part is provided with cavity means opening in the side wall of the billet which communicates directly with the pressure medium during the greater part of the extrusion and which is filled during the extrusion with a material having less resistance to deformation than the material of the billet.

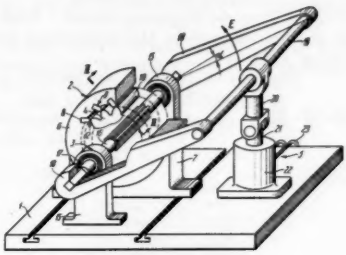
3,851,512
METHOD OF AND DEVICE FOR GEAR TEETH HARDENING

German Alexandrovich Zhuravlev, ulitsa Verkhne-Nolnaya, 10, kv.9; Efim Grigorievich Roslivker, prospekt Budennovsky, 72, kv.51; Eduard Mikhailovich Chilevich, pereulok Solyanoi Spusk, 6, kv.37, and Vladimir Samuilovich Gurevich, prospekt Oktyabrya, 18, kv.20, all of Rostov-na-Donu, U.S.S.R.

Filed Mar. 8, 1973, Ser. No. 339,349

Int. Cl. B21k *1/30*

U.S. Cl. 72—69 **9 Claims**



1. A method of gear teeth hardening by bulk peening comprising in combination the steps of:

A. providing a toothed gear element having a principal working surface which normally receives the principal working load when the gear is operative; and

B. applying a uniform technological load across and along selected areas of the principal working surface of the teeth of the gear element and strengthening the teeth along their length by bending the teeth and bulk peening of the principal working surface within a zone of critical cross section in the direction of application of principal working load.

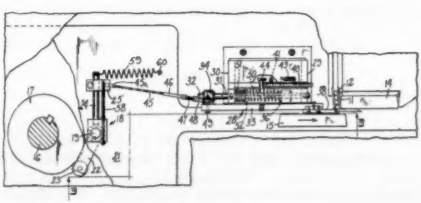
3,851,513
FEED MECHANISM FOR A THREAD ROLLER

Jiri V. Pazdirek, Waterbury, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Jan. 22, 1973, Ser. No. 325,230

Int. Cl. B21d *17/04*; **B21h** *3/06*

U.S. Cl. 72—90 **5 Claims**



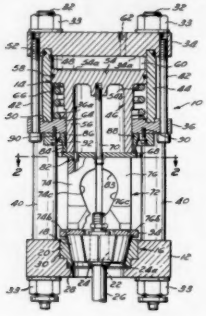
1. A feed mechanism for a thread roller which includes first and second rolling dies, one of said dies being movable relative to the other, and a chute for delivering workpieces to a position for rolling between the dies, comprising a slide having a portion thereon adapted to alternately block said chute and to permit a workpiece to move therefrom to a feeding position, and then feed the workpiece between the dies, spring means urging said slide toward a feeding position, a rotatable cam and a lever actuated by said cam, a flexible connection between said lever and said slide, whereby upon rotation of

said cam said cam and lever first permit said slide to advance in a feeding stroke under the bias of said spring means and then retract said slide through said flexible connection to store energy in said spring means, said flexible connection being ineffective to transmit a driving force on said slide during a work feeding stroke of said slide.

3,851,514
SWING-OPEN CRIMPER

Karl K. Chen, Cleveland Heights, and Hiralal V. Patel, Euclid, both of Ohio, assignors to The Weatherhead Company, Cleveland, Ohio

Filed July 18, 1973, Ser. No. 380,133
Int. Cl. B21d *41/00*
U.S. Cl. 72—402 **22 Claims**



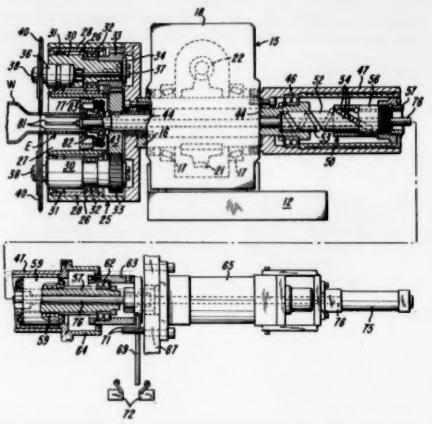
1. A machine for radially deforming a workpiece comprising a bed plate, a ram reciprocable along an axis toward and away from said bed plate, a die assembly disposed adjacent said bed plate for receiving said workpiece, driving means for advancing said ram toward said die assembly, and a pusher assembly between said ram and said die assembly for transmitting ram force to said die assembly, said pusher assembly being mounted for lateral pivotal opening movement relative to said ram to expose said die assembly.

3,851,515
APPARATUS FOR CUTTING OR DEFORMING A WORKPIECE

Charles F. Hautau, 146 Hilltop Rd., Oxford, Ohio 45056

Filed Sept. 4, 1973, Ser. No. 393,925
Int. Cl. B21d *41/04*
U.S. Cl. 72—121 **15 Claims**

1. Apparatus adapted for cutting an elongated nonrotating workpiece, comprising an annular rotor adapted to surround the workpiece, means supporting said rotor for rotation on a first axis aligned generally with the axis of the workpiece, a plurality of quills each supported eccentrically within said rotor for rotation on a corresponding second axis extending parallel to said first axis, a spindle supported within each of said quills for rotation on a corresponding third axis eccentric to said second axis of said quill and adapted to receive a rotary tool element, drive means connected to rotate said rotor for revolving said tool elements around the workpiece, a motor positioned eccentrically within said rotor, and means driven

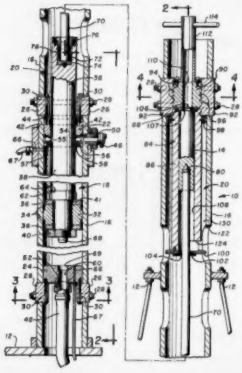


by said motor for producing simultaneous rotation of said quills within said rotor while said rotor is rotating to effect engagement of the tool elements with the workpiece.

3,851,516
METAL WORKING APPARATUS

Kenneth Bishop Garner, Tulsa, Okla., and Lewis Shepherd Roberson, Chattanooga, Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed July 23, 1973, Ser. No. 381,833
Int. Cl. B21c *23/00*
U.S. Cl. 72—256 **8 Claims**



1. Apparatus for metal working of a billet comprising:
a longitudinally extending hollow tubular member;
a pair of axially spaced end members transversely supported in said tubular member to divide the interior of said tubular member into a cylinder portion located between said two end members and a working portion;
a plurality of openings in the side wall of said tubular member adjacent each of the longitudinal positions of said end members;
end member support bodies retained in said openings in said tubular member, said support bodies having portions

thereof extending into the interior of said tubular member which overlie and are connected to a portion of said end members for transferring the load imposed on said end members to said tubular member;

a piston in said cylinder portion of said tubular member, said piston being longitudinally movable between said two end members;

a longitudinally extending working mandrel having its longitudinal axis aligned with the longitudinal axis of said tubular member, said mandrel being connected to said piston for longitudinal movement therewith, and having at least a portion of its longitudinal length disposed in said working portion of said tubular member;

a die means having a longitudinally extending billet chamber, said die means having a longitudinal passage therethrough to permit said working mandrel to enter into and pass through said billet chamber to perform the metal working of the billet;

means for supporting said die means in the working portion of said tubular member so that the axis of said billet chamber and said passage are aligned with the axis of said tubular member; and

supply means for supplying fluid to said cylinder portion for moving said piston longitudinally within said cylinder portion of said tubular member.

3,851,517

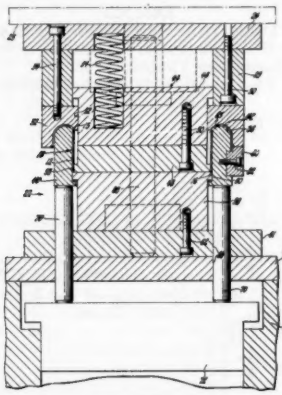
PROCESS FOR MANUFACTURING CURVED CHANNELED MEMBERS

Jack T. Greenleaf, Tipton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 193,496, Oct. 28, 1971, Pat. No. 3,787,960. This application Nov. 26, 1973, Ser. No. 419,071

Int. Cl. B21d *19/16*

U.S. Cl. 72—352 **2 Claims**



1. A process of making a thin wall channel member U-shaped in cross section and curved about a vertical center axis from a flat sheet of metal having straight top and bottom edges and having free end portions comprising the steps of providing a die set having an annular curling ring with a concave inner surface and a forming post with an annular convex outer surface which matches said inner surface, spacing said curling ring and said forming post a fixed and predetermined distance from each other so that said outer and inner surfaces form a curved path of a fixed width therebetween with an entrance thereto, providing a stationary base, longitudinally bending said sheet to provide a curved work piece, disposing said work piece on said base and against one side of said forming post, aligning one edge of said work piece with said entrance to said curved path, linearly moving said forming post and curling ring as a unit toward said work piece to progressively feed said work piece into said path to thereby outwardly curl said work piece starting from said one edge about a curved axis radially disposed with respect to vertical center axis until said one edge extends into the plane of the other of said edges so that said channel member is thereby formed, linearly moving said curling ring away from said forming post, and removing said channel member from said forming post.

3,851,518

BENDING APPARATUS FOR BENDING STRIP STEEL KNIVES

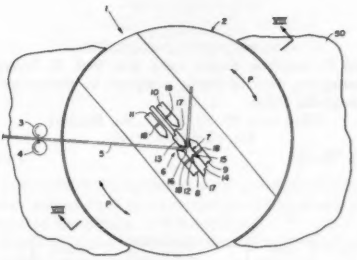
Ernst M. Spengler, Heusenstamm, Germany, assignor to SKO-MAB International Maschinen und Stahl Handelsgesellschaft M.b.H., Vienna, Austria

Filed Jan. 2, 1973, Ser. No. 320,154

Claims priority, application Germany, Jan. 4, 1972, 7200095; Nov. 16, 1972, 2256113

Int. Cl. B21d *17/02*

U.S. Cl. 72—384 **32 Claims**



1. A bending apparatus for bending strip material into shapes, comprising hammer means including a hammer head, drive means operatively connected to said hammer means for reciprocating said hammer means with a given stroke, a turntable having a rotational axis, means for freely rotatably supporting said turntable, counterholding jaw means on said turntable, said hammer head being arranged for cooperation with said counterholding jaw means, and means for positioning said strip material at a point outside said turntable.

3,851,519

INTERNAL PIPE SUPPORTING MANDREL

Edward A. Calvin; Lionel H. Wheeler, both of Houston, Tex.; Robert E. Brooks, Jr., and Wallace C. Campbell, Jr., both of Tulsa, Okla., assignors to CRC-Crose International, Inc., Houston, Tex.

Division of Ser. No. 260,275, June 6, 1972, Pat. No. 3,834,210. This application Jan. 31, 1974, Ser. No. 438,343

Int. Cl. B21d *9/00*

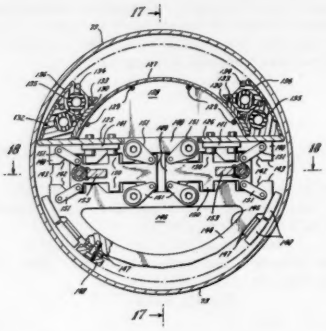
U.S. Cl. 72—466 **15 Claims**

1. An improved internal pipe supporting mandrel for use in a machine having a bending die and a stiffback, comprising:

an elongated upper pipe-engaging assembly including at least one elongated inflatable bag mounted longitudinally along the upper assembly for providing internal support to the area of the pipe which is in contact with the bending die during the bending process;

an elongated lower pipe-engaging assembly for engaging at least a part of the internal surface of the pipe in the area

of the pipe which is in contact with the stiffback; and means for moving the upper and lower assemblies away



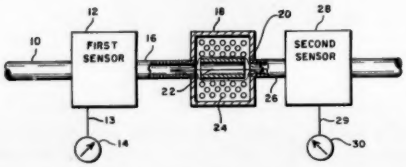
from each other and thereby forcing the upper and lower assemblies into engagement with the pipe.

3,851,520

GAS MONITORING SYSTEM

Bernard C. Schluter, Forest Lake, and Erik T. Tromborg, Bloomington, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 22, 1973, Ser. No. 362,651
Int. Cl. G01n *31/00*
U.S. Cl. 73—23 **2 Claims**



1. A method of monitoring a gas which contains a pollutant, comprising:

passing the gas through a first sensor to obtain a first signal indicative of the amount of pollutant therein;

passing the gas next through a dilution means, said dilution means being adapted to remove a known quantity of said pollutant from said gas;

passing said gas next through a second sensor to obtain a second signal indicative of the amount of pollutant remaining therein; and

wherein said dilution means passes a known percentage of said gas through an absorbing means for absorbing said pollutant and the remaining percentage of said gas is passed directly to said second sensor.

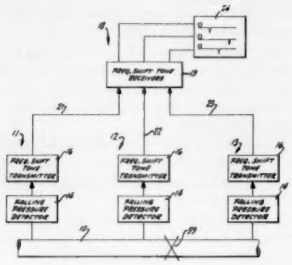
3,851,521

SYSTEM AND METHOD FOR LOCATING BREAKS IN LIQUID PIPELINES

Sidney Allan Ottenstein, Spring, Tex., assignor to M & J Valve Company, Houston, Tex.

Filed Jan. 19, 1973, Ser. No. 325,046
Int. Cl. G01m *3/16*; **F17d** *3/04*
U.S. Cl. 73—40.5 R **13 Claims**

1. In a method of detecting and locating a spontaneous leak or break between two detecting stations in a pipeline carrying liquid under pressure, the leak or break being characterized by a rapid decrease in pressure which is propagated away from the leak or break by the liquid in the line at a velocity corresponding to the velocity of sound in the liquid, the steps of generating an electrical signal at each of the detecting stations corresponding to the pressure of the liquid in the pipeline at that station, providing a reference signal at each detecting station corresponding to the normal pressure of the liquid in the pipeline at that station, comparing the electrical signal and the reference signal at each detecting station, detecting a



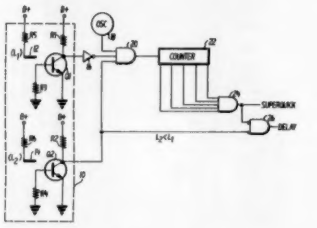
spontaneous leak or break in the line by a change in the electrical signal relative to the reference signal at each detecting station as the decrease in pressure associated with the leak or break reaches that station, and shifting the frequency of a carrier to transmit signals from the detecting stations to a receiving station when the leak or break is detected at the respective detecting stations, the signals received at the receiving station being displaced in time by an amount corresponding to the location of the leak or break relative to the detecting stations.

3,851,522

DECELERATION MEASURING APPARATUS

Clyde O. Peterson, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1973, Ser. No. 328,196
Int. Cl. G01n *3/20*
U.S. Cl. 73—84 **8 Claims**



1. Apparatus to be carried by a moving vehicle for providing an indication of the density of a target impacted by the vehicle by measuring the change of the deceleration forces applied to said apparatus upon in.pact of the vehicle with the target, said apparatus comprising:

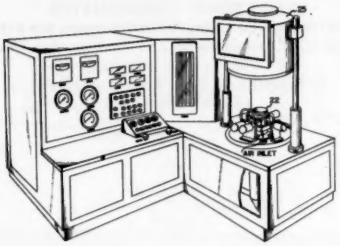
a. first and second means for generating first and second outputs upon the occurrences of deceleration forces of first and second levels, respectively, said first level being less than said second level; and

b. means responsive to said first and second output signals for measuring the time interval therebetween whereby the rate of change of the deceleration forces imposed on the vehicle is determined to provide an indication of the density of the impacted target.

3,851,523
APPARATUS FOR TESTING CARBURETORS

Vernon G. Converse, III, Franklin, and Angelo A. Lizzio, Dearborn, both of Mich., assignors to Scans Associates, Inc., Livonia, Mich.

Continuation of Ser. No. 81,203, Oct. 16, 1970, abandoned. This application July 13, 1972, Ser. No. 268,534
Int. Cl. G01m *19/00*
U.S. Cl. 73—118 4 Claims

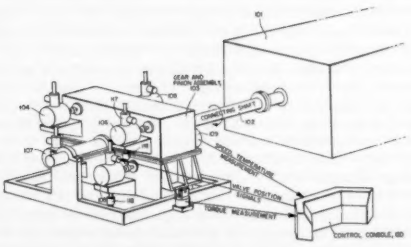


1. An apparatus for testing carburetors at a plurality of points of operation range thereof, said apparatus including a sealed chamber adapted to sealingly receive a test carburetor and hold it in place during the test, a venturi meter having a throat adapted to be operated critically at all points of its operating range outside said chamber and sealingly connected to said chamber on the upstream side of the carburetor throttle, means to create vacuum on the downstream side of the carburetor throttle, measuring means entirely on the upstream side of said venturi meter adapted to measure the actual rate of air flow to produce a continuous sensible signal related to said rate, means adapted to measure the actual rate of the resulting fuel flow through the carburetor to produce a second continuous sensible signal related to said rate of fuel flow, a device adapted to receive and to divide the value of one signal by the value of the other signal and thus to produce a third continuous signal related to the ratio of said two signals, an indicating device responsive to said third signal and adapted to give a continuous indication related to the mixture ratio produced by the test carburetor, and an air pressure and temperature device entirely upstream of said venturi meter adapted to provide a source of conditioned air to be drawn through the test carburetor.

3,851,524
DYNAMOMETER TESTING USING PLURAL POWER ASORPTION MEANS

John K. Liu, Valley Forge, Pa., assignor to Philadelphia Gear Corporation, King of Prussia, Pa.

Filed July 30, 1973, Ser. No. 383,710
Int. Cl. G01l *3/20*
U.S. Cl. 73—134 10 Claims

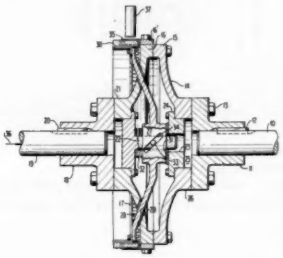


1. A system for controlling the loading torque applied to specified machinery comprising:
a. A plurality of energy absoring means;
b. Gear means for coupling said machinery to said plurality of energy absorbing means;
c. Means for measuring the present load torque applied to said machinery;
d. Input means for specifying a load for application to said machinery; and
e. Control means, responsive to the difference between said present load and the specified loading for actuating select ones of said plurality of energy absorbing means.

3,851,525
THRUST-METER UTILIZING A PHASE MEASUREMENT SYSTEM FOR THURST MEASUREMENT

James R. Parkinson, 150 White Plains Rd., Tarrytown, N.Y. 10591

Filed Oct. 13, 1972, Ser. No. 297,304
Int. Cl. G01l *5/12*
U.S. Cl. 73—140 13 Claims



1. A power delivery system in which power is delivered from a power driven shaft to an output power shaft and thrust is determined comprising, in combination:
a. coupling means which is torsionally and radially stiff but axially soft including
1. first diaphragm means coupled to said driven shaft, and
2. second diaphragm means coupled to said power shaft, said first and second diaphragm means being connected together and having a periphery composed of a first set of magnetically permeable teeth;
b. thrust-responsive wheel means, said wheel means having a periphery composed of a second set of magnetically permeable teeth;
c. connecting means connecting said wheel means to said coupling means for effecting angular displacement of said wheel means relative to said coupling means responsive to relative axial displacement of said first and second diaphragm means;
d. sensing means positioned in the vicinity of said first set and said second set of teeth; and
e. circuit means coupled to said sensing means and responsive to signals therefrom for developing a signal representative of the relative angular position of said first set of teeth with respect to said second set of teeth;
whereby an indication of thrust of the system may be developed.

3,851,526
FLUID FLOWMETER

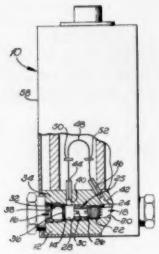
Charles F. Drexel, Rolling Hills Estates, Calif., assignor to Tylan Corporation, Torrance, Calif.

Filed Apr. 9, 1973, Ser. No. 349,169
Int. Cl. G01f *1/00*; F15d
U.S. Cl. 73—202 10 Claims

1. A flowmeter comprising:
a housing having a fluid inlet and a fluid outlet defining a first fluid path therebetween;
a flow restrictor in said first fluid path comprising at least

one disk having a front surface and a rear surface connected by a perimeter surface, an opening through said front and rear surfaces and at least one conduit through said perimeter surface to said opening, said conduit being of a length to diameter ratio to provide laminar flow;

means for supporting said restrictor in said first fluid path whereby the flow therethrough is directed radially in either direction between the perimeter and the opening of said at least one disk;



an elongate conduit defining a laminar flow second fluid path;

means for measuring the rate of flow of fluid through said elongate conduit; and

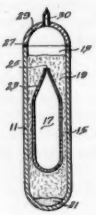
means for connecting said second fluid path in parallel with said first fluid path on opposite flow sides of said flow element.

3,851,527

MAXIMUM TEMPERATURE MONITOR

Gerard L. Hofman, Downers Grove, Ill., and Gary D. Hudman, Idaho Falls, Idaho, assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Jan. 21, 1974, Ser. No. 435,386
Int. Cl. G01k *11/00*
U.S. Cl. 73—368 **12 Claims**



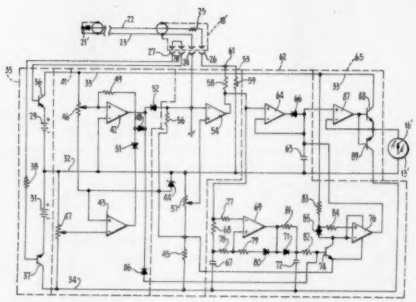
1. A device for determining maximum temperature occurrence comprising a sealed vessel including first and second chambers, said second chamber having a restricted opening communicating with said first chamber; a source substance disposed within said first chamber, said source substance capable of exerting substantial vapor pressure at said maximum temperature; heat transfer means for conducting heat to said first chamber to increase the vapor pressure of said source substance and for subsequently conducting heat from said second chamber to condense a portion of said substance within said second chamber; and access means for segregating said portion of substance within said second chamber from said substance within said first chamber in order to quantitate said condensed portion within said second chamber and thereby determine maximum temperature occurrence.

3,851,528

ELECTRONIC THERMOMETER

Herbert F. Nichols, San Jose, and Joel Bauman, San Francisco, both of Calif., assignors to Joel Bauman, San Francisco, Calif.

Filed Oct. 6, 1972, Ser. No. 295,448
Int. Cl. G01k *7/24*
U.S. Cl. 73—362 AR **4 Claims**

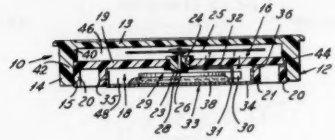


1. An electronic thermometer especially useful for measuring man and animal body temperatures comprising a temperature probe of a material in which a voltage develops when a constant current flows therethrough, which voltage changes generally proportionately to changes in the temperature of said material; circuit means for translating variations in the voltage in said material indicative of temperature changes into temperature readings, said circuit means including a feedback operational amplifier having its feedback connection from its output terminal to a first inverting one of its primary input terminals for maintaining the potential at said first primary input terminal at essentially the same potential as the second non-inverting primary input terminal of said amplifier, said feedback connection passing through said material to provide current flow therethrough, means for applying an essentially constant potential to said second primary input terminal of said amplifier, resistance means connected between a generally constant potential source and said first primary input terminal to thereby provide a source of constant current flow through said temperature probe material and said feedback connection, said material being connected to said output terminal of said amplifier in said feedback connection through a first one of a pair of resistances, the second one of which is connected between the amplifier output terminal side of said material and a generally constant potential source to cause current variations in said first resistance which are proportional to potential variations at the amplifier output terminal side of said material and any voltage changes at the output terminal of said amplifier are proportional to but greater than voltage changes at the output terminal side of said material both constant current flow through said material and voltage amplification is obtained with a single operational amplifier; indicating means connected with said circuit means for displaying said temperature readings; and a probe cord electrically connected between said probe and said circuit means for conveying variations in said voltage across said material to said circuit means.

3,851,529
DIAL THERMOMETER

Richard A. Andrews, Taylor, and Ralph B. Remick, Jr., Farmington, both of Mich., assignors to H. O. Trerice Co., Oak Park, Mich.

Filed Dec. 13, 1972, Ser. No. 314,543
Int. Cl. G01k 1/16
U.S. Cl. 73—362.8 4 Claims

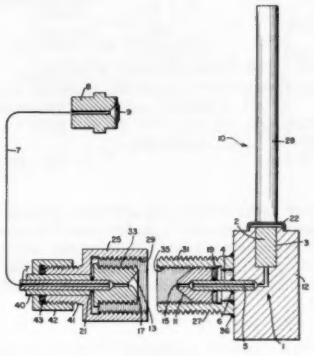


1. A thermometer of the surface contact type comprising a circular outer casing having an axis, said casing including a generally flat transparent face and an axially and rearwardly extending integral and annular flange including inner and outer flange portions, the inner surface of the outer flange portion being formed on a larger diameter than the inner surface of the inner flange portion, the inner surfaces of said inner and outer flange portions being connected by an annular locating shoulder which lies in a plane which is parallel to said transparent face, a circular inner mounting body including a generally flat, circular readoff dial face calibrated in temperature values and a pair of concentric outer and inner axially and rearwardly extending integral and annular ribs, said ribs being spaced apart and connected only on the forward ends thereof by said dial face, the space between said ribs being open to the atmosphere, said inner mounting body being received in said outer casing, with the outer periphery of said circular face abutting the annular locating shoulder of said circular outer casing and with said outer rib in surface to surface contact with the inner surface of the outer flange portion rearwardly of said locating shoulder, said circular dial face being spaced from said flat transparent face to define with said inner portion of said flange a first compartment which is closed to atmosphere, a relatively flat thermally sensitive conductive plate of a thin gauge metal material, said plate including a circular sensor panel part and an axially and forwardly extending integral annular rim which is received in and has a force-fit with said inner rib of said inner mounting body, said sensor panel part being adapted to be exposed in flat-wise conducting contact with a body which is to be heat-monitored, said plate member being spaced from said dial face to define a second compartment, a substantially flat coiled bimetallic sensing member in said second compartment having an outer end fixedly mounted on the side of said sensor panel part opposite said contact surface of the latter, and an inner end substantially coplanar with said outer end and responding flexibly and rotatively to variations in temperature of the body which is to be heat-monitored as conductively transmitted by said sensor panel part, an indicator in said first compartment overlying said dial face, a shaft located on said axis and extending through said dial face in sealed relation therewith into said first and second compartments and connecting said indicator in said first compartment to said inner end of the center-most convolution of said sensing member in said second compartment, said indicator being movable rotatively with said inner end of said sensing member and concurrently with coiling flexure of said sensing member so as to move across said dial face, a mass of highly heat-conductive fluid material in said second compartment contacting said sensor panel part of said plate member, in which mass said coiled sensing member is substantially immersed sufficiently to enhance heat transmission between said sensor panel part and said sensing member and to dampen vibration of said indicator and of said sensing member in its flexure.

3,851,530
VOLUMETRIC MEASURING SYSTEM

James Arthur Symonds, Penfield, and Howard Randall Jaquith, Rushville, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Feb. 9, 1973, Ser. No. 331,269
Int. Cl. G01l 7/00
U.S. Cl. 73—395 7 Claims



1. In a volumetric measuring system having a sealed envelope solidly filled with substantially incompressible liquid,

wherein said envelope includes a sensing portion responsive to a condition for causing the internal pressure of said liquid to correspond to said condition,

wherein said envelope includes a signal portion responsive to said internal pressure for producing a signal corresponding to said internal pressure,

wherein said envelope includes a capillary portion for transmitting internal pressure changes between said sensing and signal portions;

wherein said capillary portion has a thimble and a socket each forming a part of said capillary portion, and there being a base, said thimble having means connecting it to said base;

the improvement wherein there is a rigid member rigidly fixed to said thimble and, independently of said means, also to said base, and said socket and said thimble being forcibly interengaged for urging said thimble and socket into contact with each other with such force as to strain the material thereof continuously throughout a given area of mutual contact, said thimble and socket each having a capillary passage having openings within said area and registering with one another for defining the thimble and socket parts of said capillary portion.

3,851,531
ELECTRONIC FUZE SYSTEM

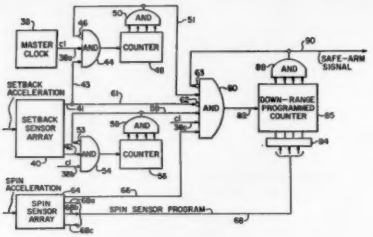
Marvin H. White, Laurel; David D. O'Sullivan, Bethesda, both of Md., and Richard G. Hamel, Margate, Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 121,040, March 4, 1971, Pat. No. 3,750,583. This application Apr. 17, 1973, Ser. No. 353,252
Int. Cl. G01p 15/08
U.S. Cl. 73—510 11 Claims

1. A circuit for providing acceleration information about an object comprising, in combination;

an accelerometer means for signaling when said object attains at least a predetermined minimum acceleration level, said signal being present only when said object continues to move at least at said predetermined minimum acceleration level;

means responsive to said accelerometer signal for providing



a second signal indicate the sustained presence of said accelerometer signal for a predetermined time; and

means for transmitting said accelerometer signal to said means responsive to said accelerometer signal and for terminating said transmission in response to said second signal.

3,851,532

STARTER FOR INTERNAL COMBUSTION ENGINES

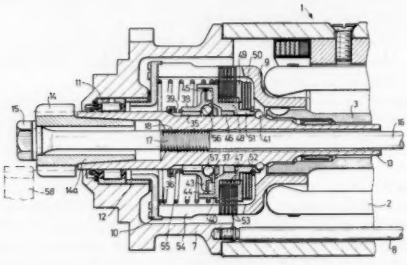
Gerhard Pfluger, Markgroningen, and Ludwig Bolz, Waiblingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed June 19, 1973, Ser. No. 371,564

Claims priority, application Germany, July 10, 1972, 2233838

Int. Cl. F16d *7/02*, *47/04*; **F02m** *11/00*

U.S. Cl. 74—7 A **20 Claims**



1. In a starter for an internal combustion of the type having a torque receiving gear, a combination comprising an electric motor having a rotary armature shaft; a second shaft coaxial with and movable axially of said armature shaft; a pinion secured to said second shaft; shifter means actuatable to move said second shaft axially and to thereby place said pinion into mesh with said gear; and a torque transmitting unit interposed between said shafts and including a friction clutch and an overrunning clutch, said friction clutch being driven by said armature shaft and said overrunning clutch being driven by said friction clutch and arranged to rotate said second shaft, said overrunning clutch comprising a first clutch element movable lengthwise of and arranged to rotate with said second shaft and a second clutch element rotatable on said second shaft and receiving torque from said friction clutch, said clutch elements having mating claws which transmit torque from said second clutch element to said first clutch element when said second clutch element receives torque from said friction clutch and said pinion drives said gear.

3,851,533

ELECTRICALLY OPERATED WINDOW LIFTING MECHANISM

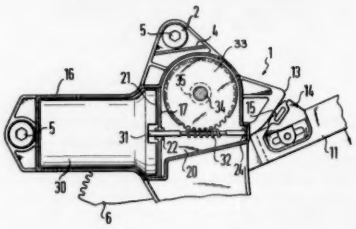
Bernhard Dehler, Coburg, Germany, assignor to Metallwerk Max Brose & Co., Coburg, Germany

Continuation-in-part of Ser. No. 260,628, June 7, 1972, Pat. No. 3,783,702. This application June 14, 1973, Ser. No. 370,045

Claims priority, application Germany, June 28, 1971, 2132067

Int. Cl. F16h *27/02*

U.S. Cl. 74—89 **4 Claims**



1. A window lifting mechanism for an automotive vehicle comprising:

a. a base plate extending in a principal plane;

b. fastening means for fastening said base plate to a window support of said vehicle;

c. a housing offset from said plane in one transverse direction,

1. said base plate and said housing jointly constituting a unitary piece of substantially rigid material,

2. said housing bounding a cavity therein and including a first portion of a partition wall separating said cavity into a motor compartment and a transmission compartment;

d. an electric motor mounted in said motor compartment and having a drive shaft;

e. a speed-reducing transmission in said transmission compartment,

1. said housing being formed with an opening dimensioned for passage of said motor and of said transmission into and out of said compartments respectively;

f. a cover member releasably closing said opening and including a second portion of said partition wall,

1. said portions abuttingly engaging each other and jointly constituting the shell of a first bearing interposed between said portions,

2. said housing carrying a second bearing in said transmission compartment, said drive shaft being journaled in said first and second bearings and constituting the input shaft of said transmission,

3. said housing and said cover further carrying two coaxial main bearings respectively,

4. said transmission including an output shaft journaled in said main bearings;

g. a window lifting arm pivotally mounted on said base plate and offset from said principal plane in the other transverse direction; and

h. motion transmitting means connecting said arm to said transmission and including a segment gear fixedly fastened to said arm and a pinion attached to said output shaft and meshingly engaging said segment gear, said transmission further including

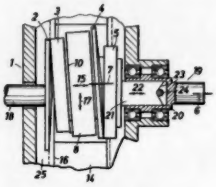
1. a worm fixed on said input shaft intermediate said first and second bearings, and

2. a worm wheel mounted on said output shaft and meshing with said worm.

3,851,534
VARIABLE RATIO FRICTION TRANSMISSION

Paul Stober, Pforzheim, Germany, assignor to Gebr. Stober, Pforzheim, Germany

Filed May 29, 1973, Ser. No. 364,332
Claims priority, application Germany, May 31, 1972, 2226447
Int. Cl. F16h *15/16, 15/08*
U.S. Cl. 74—193 **16 Claims**

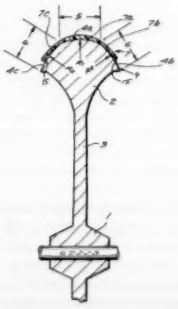


1. A variable friction drive transmission comprising: a frame, parallel input and output shafts rotatable in said frame in axially spaced relation, a first friction cone and a first friction ring each mounted on a respective one of the adjacent ends of said input and output shafts, a second friction ring engaging said first friction cone and a second friction cone engaging said first friction ring, an intermediate shaft, said second cone and second ring being fixed to opposite ends of said intermediate shaft and engaging the respective first ring and cone in radially spaced relation to the axis of said intermediate shaft on opposite sides thereof, a support supporting said intermediate shaft and moveable at an angle to the axes of said input and output shafts to vary the drive ratio of said transmission, means for maintaining said friction cones and friction rings in frictional engagement in adjusted positions of said intermediate shaft, said frame having a wall parallel to said input and output shafts and a first guide groove therein extending at right angles to said input and output shafts, and a carriage slidable in said first guide groove and having a second guide groove therein at right angles to the first guide groove, said support having a portion slidably engaging said second guide groove.

3,851,535
SPECIAL BELT AND PULLEY RIM TRANSMISSION DEVICE

Shelley M. Presentey, 1268 Henry Farm Dr., Ottawa, K2C2E2, Canada

Filed Apr. 6, 1973, Ser. No. 348,740
Int. Cl. F16h *7/00*
U.S. Cl. 74—229 **11 Claims**

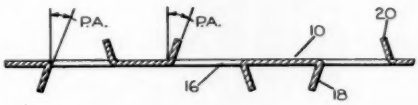


1. In a belt transmission, a combination comprising a rotary crowned pulley having a rim provided with a multiconvex peripheral surface including a central section and additional sections flanking said central section; and an endless belt trained over said peripheral surface so as to overlie said central section and at least a portion of each of said additional sections, said belt having an internal surface having said pulley rim which is convex when said belt is unstressed and which is in more pronounced frictional engagement with said central section and in less pronounced frictional engagement with said additional sections when said belt is trained over said peripheral surface, as a result of the original convexity of said internal surface of said belt and the multiconvexity of said peripheral surface.

3,851,536
POWER TRANSMISSION BELT

Maurice I. Zeldman, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 16, 1973, Ser. No. 333,212
Int. Cl. F16g *1/00*
U.S. Cl. 74—231 M **6 Claims**

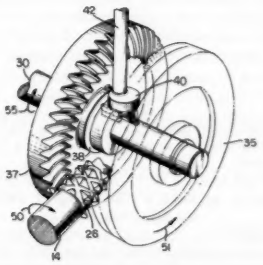


1. A power transmission belt for transmitting power from a gear to at least one other gear comprising a continuous flexible belt being formed with a plurality of longitudinal cut-out sections, a pair of teeth provided on said belt at opposite ends of said cut-out sections, the teeth in each pair having free ends one of which extends upwardly and one of which extends downwardly, said adjacent upwardly and downwardly extending teeth of each pair, being configured in such a manner so as to engage a gear tooth in such a way that the belt is adapted to ride at the pitch diameter of said gear.

3,851,537
GEAR DRIVE REVERSING MECHANISM

Gerhard A. Nickstadt, Oakland, N.J., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 284,946, Aug. 30, 1972, Pat. No. 3,812,736. This application Feb. 19, 1974, Ser. No. 443,439
Int. Cl. F16h *57/10, 55/04*
U.S. Cl. 74—404 **4 Claims**



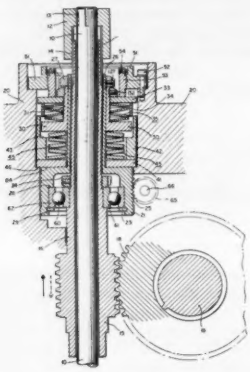
1. A gear drive reversing mechanism comprising a first shaft mounted for rotation about a first shaft axis; a first face gear mounted to said first shaft and having right-hand spiral angle face gear teeth; a second shaft mounted for rotation about a second shaft axis; a second face gear mounted to said second shaft and having left-hand spiral angle face gear teeth; and a rotatably mounted pinion having right-hand spiral angle pinion gear teeth in mesh with said right-hand spiral angle face

gear teeth and having left-hand spiral angle pinion gear teeth in mesh with said left-hand spiral angle face gear teeth; whereby rotation of said pinion in a constant rotary direction drives said first and second shafts in mutually opposite rotary directions.

3,851,538
TORQUE SWITCH MECHANISM

Walter J. Denkowski, and John Zouzoulas, both of King of Prussia, Pa., assignors to Philadelphia Gear Corporation, King of Prussia, Pa.

Filed May 21, 1973, Ser. No. 362,424
Int. Cl. F16h *1/16*
U.S. Cl. 74—425 **8 Claims**



1. In a worm and worm gear mechanism in which the worm is subjected to axial thrust forces in either of two linear directions according to torque forces developed on said worm gear in corresponding rotational directions, said mechanism characterized by the provision of:

a. first pre-loaded compression spring restraining means for allowing axial displacement of said worm in one or the other of said linear directions when the thrust forces on said worm, resulting from torque forces on said worm gear in a corresponding rotational direction, exceed a first pre-selected relatively low value;

b. second pre-loaded compression spring restraining means for allowing further axial displacement of said worm in the same linear direction when the thrust forces on said worm resulting from torque forces on said worm gear in said same corresponding rotational direction, exceed a second pre-selected relative higher value.

3,851,539
WORM REDUCTION GEARING DRIVE

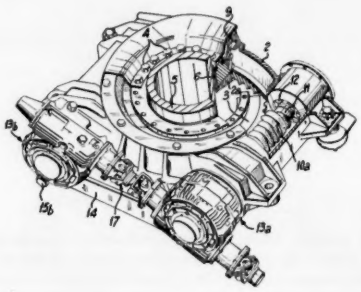
Francois Durand, 108, Boulevard Carnot, 78 Le Vesinet (Yvelines), France

Filed Aug. 28, 1973, Ser. No. 392,185
Claims priority, application France, Sept. 7, 1972, 72.31831
Int. Cl. F16h *1/16*
U.S. Cl. 74—425 **4 Claims**

1. A reduction gearing device for rotatably driving a shaft from a rotary motor shaft, which comprises in combination:

a. a main worm gearing comprising:
- a case,
- a toothed crown wheel rotatably mounted in said case and adapted to be drivingly connected to the shaft to be driven,
- a pair of worms rotatably mounted in the saem case and in constant meshing engagement with said toothed crown wheel, said worms being disposed at diametrally opposed locations in relation to said crown wheel,

b. a pair of primary worm gearings each adapted to drive one of said main reduction gearing worms, and comprising each:
- a driven toothed wheel rotatably rigid with the corresponding worm,
- a driving worm meshing with said toothed wheel, and a freely mounted case without any means for anchoring same to a fixed point,



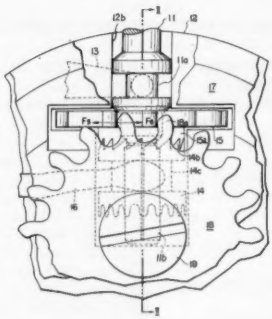
c. a tie-bar having its ends pivoted to the cases of said pair of primary worm gearings, and

d. means for coupling the worm shafts of said pair of primary worm gearings to each other, said coupling means being adapted to accomodate a certain angular misalignment between said worm shafts.

3,851,540
PERPENDICULARLY MESHING SPUR GEARING

Hidetaka Tutiya, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed June 22, 1973, Ser. No. 372,572
Claims priority, application Japan, June 24, 1972, 47-75019
Int. Cl. F16h *55/04, 55/06*
U.S. Cl. 74—437 **3 Claims**



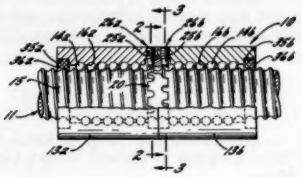
1. A transmission gearing comprising two mutually perpendicularly engaging spur gears, each tooth of at least one gear of said gearing having a rounded and locally projecting motion-transmitting projection positioned in its pseudoaddendum range within the tooth width of the mating gear during meshing and directed towards its mating gear, each of said projections being kept in contact with the related tooth of the mating gear substantially during the whole engaging period of the related gear teeth.

3,851,541

DIFFERENTIAL BALL NUT ASSEMBLY

Helmut Ploss, Wolfschlugen, and Hans-Joachim Hildebrandt, Nurtingen-Oberensingen, both of Germany, assignors to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Nov. 15, 1973, Ser. No. 415,950
Int. Cl. F16h 55/22
U.S. Cl. 74—459 9 Claims



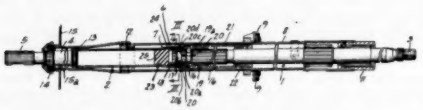
1. A ball nut assembly comprising first and second axially alined nuts, a connector ring telescoped into said nuts and spanning the joint between the nuts, first and second axially spaced rows of circumferentially spaced recesses formed in said ring and located on opposite sides of said joint, there being a different number of recesses in said first row than in said second row, first and second tapped holes formed through said first and second nuts, respectively, and registerable with the recesses in the respective rows, and first and second screws threaded releasably into said first and second tapped holes, respectively, and tightly received in one of the recesses in the respective rows to prevent relative rotation between said nuts and said ring.

3,851,542

COLLAPSIBLE STEERING COLUMNS

Frederick John Adams, Campton, and Howard Kenneth Alderton, Luton, both of England, assignors to Cam Gears Limited, Hitchin, Hertfordshire, England

Filed May 1, 1973, Ser. No. 356,084
Claims priority, application Great Britain, May 2, 1972, 20281/72
Int. Cl. B62d 1/18
U.S. Cl. 74—492 12 Claims



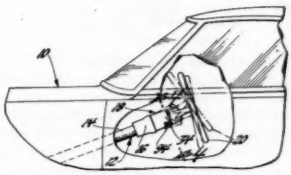
1. A collapsible steering column assembly comprising:
first and second coaxially and telescopically related torque transmitting members for connection between a steering wheel and a steering gear of a vehicle;
coupling means connecting said first and second members for mutual rotation;
at least one shearable member connecting said first and second members to normally prevent relative telescopic movement therebetween and shearable to permit relative telescopic movement upon the application of an abnormal axial load on said assembly; and
a third member, separate from said first and second members, disposed between said first and second members, said third member forced axially through the outer one of said coaxial members by the inner one of said coaxial members upon application of an abnormal axial load and including at least a portion having a lateral dimension greater than that of the outer member which causes progressive deformation of said members and consequent energy absorption,
said first member including a shaft, said second member including a tube mounted coaxially about said shaft, said shaft including a section having a polygonal cross section, and comprising a sleeve mounted within said tube and having a complemental polygonal bore receiving said polygonal cross section of said shaft, said section of said shaft including means defining a peripheral groove therein, said shearable member including a shear pin extending through said tube and said sleeve and into said groove.

3,851,543

ADJUSTABLE STEERING COLUMN

Lynn C. Krom, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 10, 1973, Ser. No. 359,002
Int. Cl. B62d 1/18; G05g 5/06
U.S. Cl. 74—493 3 Claims



1. In a steering column assembly including a lower section and an upper section movably mounted on said lower section for tiltable adjustment relative thereto generally in a plane, latch means for securing said sections in any selected one of a plurality of adjusted positional relationships comprising a rod pivotally secured at one end thereof to one of said sections and the other end thereof having a tooth conformation, a tubular collet secured to the other of said sections and coaxially receiving said other end of said rod, said collet having a plurality of longitudinal slots defining fingers radially contractible and expandable with respect to said rod, tooth means on said fingers engageable with said other end of said rod and a taper surface on each finger adjacent said collet and sildable over said taper surfaces in a direction to forcibly contract said fingers, means biasing said cone in said direction, and means manually operable to slide said cone in an opposite direction to permit expansion of said tooth means out of engagement with said other end of said rod, said manually operable means including a pivotable lever extending in a plane oriented transversely of the plane of tilting of said sections and means responsive to pivoting of said lever to overcome said biasing means and effect said sliding of said cone, whereby when said tooth means is disengaged from said other end of said rod said upper column section is freely adjustable relative to said lower section to a selected positional relation therewith and contraction of said tooth means into engagement with said other end of said rod holds said sections in said selected relation.

3,851,544

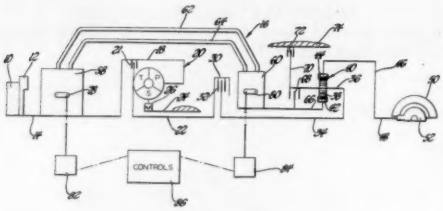
TRANSMISSION WITH TORQUE CONVERTER AND HYDROSTATIC DRIVES

Stanley W. Herman, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1972, Ser. No. 305,300
Int. Cl. F16h 47/04, 47/08, 47/00
U.S. Cl. 74—677 4 Claims

1. A transmission for a reciprocating piston engine comprising transmission input and output means, a hydrodynamic torque converter having pump means operatively connected to said input means and having turbine means driven by fluid

pumped thereto from said pump means, a simple planetary gear unit having a sun gear, a ring gear and planet gears drivingly connecting said sun and ring gears and further having a carrier for said planet gears, means directly connecting said ring gear with said transmission output means, first selectively engageable clutch means for drivingly connecting said turbine means with said planetary carrier of said gear unit, second selectively engageable clutch means operatively connected to said carrier and said sun gear for locking the members of said planetary gear unit together so that said torque converter can drive said output means, a hydrostatic pump unit connected in series with said input means and said torque converter, means directly drivingly connecting said hydrostatic pump



unit to said transmission input means, a hydrostatic motor unit hydraulically connected to said hydrostatic pump unit, torque transmitting shaft means directly connecting said hydrostatic motor means to said sun gear of said planetary unit, and displacement control means operatively connected to at least one of said hydrostatic units to provide for the hydrostatic drive of said sun gear when set at a predetermined stroke and said second clutch means is released so that said transmission output means is forwardly driven by said torque converter and said hydrostatic units and to further provide for the overdrive of said output means as the speed of said sun gear is subsequently reduced to zero by reducing the displacement of one of said hydrostatic units to zero.

3,851,545

CONTINUOUSLY VARIABLE TRANSMISSION

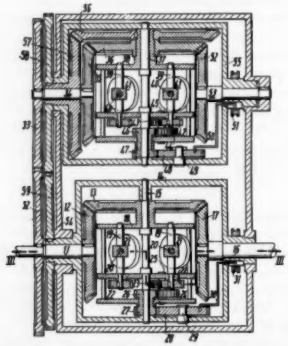
Geert Gumlich, Sommerfieldring No. 19, 1 Berlin 39, Germany

Filed Aug. 24, 1972, Ser. No. 283,534

Claims priority, application Germany, Aug. 31, 1971, 2144213

Int. Cl. F16h *3/74*

U.S. Cl. 74—751 **3 Claims**



1. A continuously variable transmission including a main housing, a rotatable frame in said housing carried by coaxial driving and driven shafts extending into said housing, gyro cage shaft means extending substantially perpendicular to the axis of said coaxial driving and driven shafts, gyro cage means rotatably mounted on said gyro cage shaft means, bevel gears mounted on said driving and driven shafts and a bevel gear therebetween and meshing therewith mounted on said gyro cage shaft means, a pair of gyro support shafts mounted on said gyro cage means, gyros having spin axles mounted on each of said gyro support shafts, said spin axles being substantially perpendicular to said gyro support shafts, and means connecting said gyro support shafts together and relative to said gyro cage shaft means to maintain said spin axles in parallel relation.

3,851,546

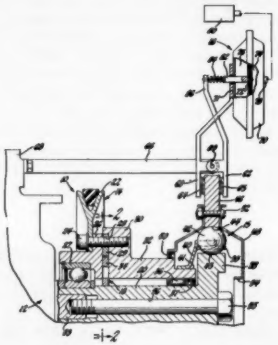
TRANSMISSION

Richard K. Kepple, Huron, and Claude A. Smith, Sandusky, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 14, 1973, Ser. No. 360,365

Int. Cl. F16h *57/10, 3/44;* **F16d** *19/00;* **B61k** *13/00*

U.S. Cl. 74—785 **3 Claims**



1. For use with a vehicular engine, an accessory drive transmission comprising a belt-driven input pulley and an output shaft; a planetary drive unit including an output ring member, an input sun member, a plurality of planets operatively connected between said inner sun and outer ring members, and a carrier member for driving said planets; connector means surrounding said output shaft for connecting said carrier member to said input pulley for rotation therewith; a source of vacuum reflective of engine speed; a housing; a diaphragm serving as a movable wall to form first and second chambers in said housing; a line for communicating a vacuum signal from said source to said first chamber; a stem mounted on said diaphragm and extending axially through said second chamber and the wall of said housing; a reaction friction member secured adjacent one face of said outer ring member; a second friction member movably mounted adjacent the other face of said outer ring member; a lever member pivotally mounted adjacent said second friction member; a spring interconnecting said lever member and said stem for permitting said diaphragm to move through said first chamber to the wall of said housing while said second friction member moves only a short distance to frictionally engage said outer ring member; said second friction member being urged into contact with said other face of said outer ring member, thereby frictionally confining said outer ring member between said second friction member and said reaction friction member in response to pivotal movement by said lever member caused by axial movement of said diaphragm responsive to a vacuum signal indicative of engine speed below a predetermined value; and a one-way clutch mounted intermediate said carrier member

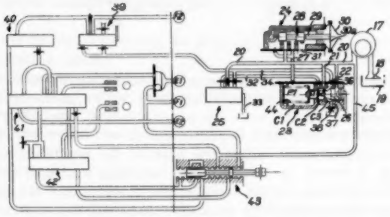
and said output shaft for driving said output shaft directly upon disengagement of said second friction member from said other face of said outer ring member in response to vacuum signals indicative of engine speeds above said predetermined value.

3,851,547

HYDRAULIC CIRCUITS FOR CONTROLLING AUTOMATIC GEAR BOXES

Jean Piret, Bougival, and Philippe Quemerais, Villepreux, both of France, assignors to Regie Nationale des Usines Renault, Billancourt and Ste Automobiles Peugeot, Paris, both of, France

Filed Apr. 13, 1973, Ser. No. 350,730
Claims priority, application France, July 19, 1972, 72.26043
Int. Cl. B60k *21/00*
U.S. Cl. 74—869 **4 Claims**



1. In a hydraulic circuit for controlling an automatic gear box in which selection of the drive ratio is effected by selective actuation of clutch means and brake means,

hydraulic control means associated with the clutch means and the brake means,

an output regulation valve, said valve being connected to the control means,

a hydraulic distributor,

a pressure regulation valve, the hydraulic distributor and the pressure regulation valve being operative to control the output regulation valve,

a pilot valve responsive to the value of the vacuum in the inlet manifold of an engine driving the gear box, and operative to control the pressure regulation valve,

a reservoir for hydraulic fluid,

pump means operative to feed fluid from the reservoir, said pump means having an outlet, the pressure regulation valve defining an outlet path from the pump outlet to the reservoir,

duct means connecting the output path to the hydraulic distributor and to the output regulating valve, and

a calibrated orifice located at the outlet of the regulation valve to create a pressure drop in the said outlet path such that the hydraulic distributor and the output regulating valve are controlled in response to the speed of the engine.

3,851,548

TOOL FOR REMOVING THREADED CLOSURES

Walter Rutz, Oberer Graben 44, Saint Gallen, Switzerland

Continuation-in-part of Ser. No. 210,013, Dec. 20, 1971, abandoned. This application Jan. 4, 1974, Ser. No. 430,873
Claims priority, application Switzerland, Dec. 22, 1970, 508550/70
Int. Cl. B67b *7/00*; **B25b** *13/52*
U.S. Cl. 81—3.43 **19 Claims**

1. A tool for manipulating objects, particularly closures, comprising a handle; a flexible elongated object engaging element having a loop portion adapted to surround and engage an object, said object engaging element also having a pair of end portions; a first abutment member movable between an operative position in which it is adapted to cooperate with said loop portion for engaging objects having a first range of sizes and an inoperative position; a second abutment member provided on said handle and adapted to cooperate with said loop portion for engaging objects having a second range of sizes

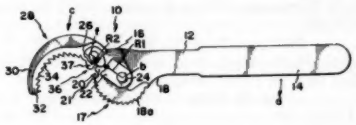
when said first abutment member is in said inoperative position; and means for varying the length of said loop portion and for preventing unintentional variations of said length, said means being operatively connected with at least one of said end portions.

3,851,549

SELF-ADJUSTING, SELF-TIGHTENING MULTIPURPOSE WRENCH

Charles D. Schlitt, 305 Donahue Beach, Bay City, Mich. 48706, and Douglas M. Federspiel, 323 S. Linwood Beach, Linwood, Mich. 48634

Filed Nov. 3, 1972, Ser. No. 303,592
Int. Cl. B25b *13/28*
U.S. Cl. 81—106 **7 Claims**



1. A self-adjusting, self-tightening, wrench for gripping and turning an object, such as a pipe, comprising;

an elongate handle having a jaw fixed at one end;

link means mounted on said jaw for swinging movement about a first axis;

a movable jaw mounted on said link means for movement therewith about said first axis and for swinging movement relative thereto about a second axis toward and away from said fixed jaw; and

drive means coupling said jaws for bodily swinging said movable jaw orbitally about said first axis and concurrently positively swinging said movable jaw on said link means about said second axis.

3,851,550

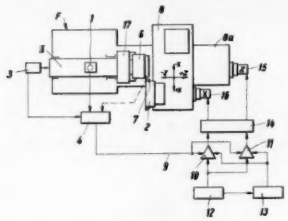
ADAPTIVE CONTROL SYSTEM FOR PROGRAM-OPERATED MACHINE TOOLS

Erhard Schalles, Ubbedissen near Bielefeld, Germany, assignor to Werkzeugmaschinenfabrik Gildemeister & Comp. Aktiengesellschaft, Bielefeld, Germany

Filed Sept. 7, 1972, Ser. No. 287,087
Int. Cl. B23b *21/00*
U.S. Cl. 82—2 B **9 Claims**

1. In a machine tool for turning a rotating workpiece by a material removing tool which is movable in first and second

directions at rates determined by first and second variable-speed motors, an adaptive control system comprising first and second adjustable regulating devices each operatively connected with a different one of said motors, said devices having characteristic curves one of which is phase-shifted relative to and trails the other curve by 90°; first and second measuring means for furnishing to said regulating devices a first signal indicative of the torque applied to and the RPM of the workpiece and thus representing the actual output of the machine



tool; and a command unit for furnishing to said regulating devices second and third adjusting signals respectively indicating the desired output and the desired final contour of the workpiece, said regulating devices being arranged to regulate the speed of said motors in response to said signals so that the geometric sum of movements of said tool in said first and second directions is constant and that the ratio of movements of said tool in said first and second directions, and hence the direction of actual movement of said tool, is proportional to the deviation of said first signal from said second signal.

3,851,551

TOOL ASSEMBLY, PARTICULARLY FOR LATHE CHIP SEPARATING TOOLS

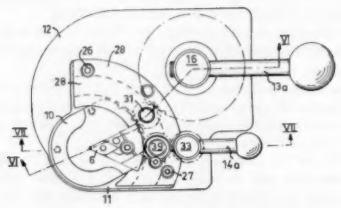
Peter Christoph Bergstrom, Kofallsvagen 44, S-710 40 Frovi; Dick Carl Birger Birgersson, Ringvagen 7, and Jan Gustav Harald Birgersson, Ekliden 6, both of S-573 00 Tranas, all of Sweden

Filed Jan. 26, 1973, Ser. No. 327,119

Claims priority, application Germany, Feb. 9, 1972, 7204774; Sweden, Oct. 18, 1972, 13443/72

Int. Cl. B23b *29/00*; B26d *1/00*

U.S. Cl. 82—37 **5 Claims**



1. A tool assembly comprising a lathe chip separating tool and a holder for the lathe tool, means mounting said holder for rotation about an axis that passes through the point of the tool or, in the case of a round-nosed tool, through the center of the nose radius, a swiveling device for rotating the holder about said axis, and gearing interposed between the swiveling device and the tool holder, said gearing including a rotatable gear disposed between and in mesh with said swiveling device and said tool holder thereby to turn said tool holder in the same direction as said swiveling device upon swiveling of said swiveling device, said tool holder and said swiveling device having gearing thereon of the same radius whereby said tool holder rotates by the same angular amount as said swiveling device.

3,851,552

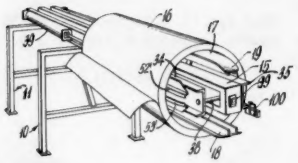
SLITTING MACHINE

Richard B. English, Coplay, and Rudolph T. Benson, Jr., Walnut Port, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Continuation-in-part of Ser. No. 267,464, June 29, 1972, abandoned. This application Oct. 17, 1973, Ser. No. 407,091

Int. Cl. B26d *3/08*

U.S. Cl. 83—9 **22 Claims**



1. A slitting machine, comprising frame means including bore-contacting means extending along and within the bore of an elongated tubular work piece for removably supporting the work piece with its axis fixedly oriented, said frame including an elongated guide within the bore of the supported work piece, a shuttle including means coacting with said guide within the bore of the work piece, reciprocable actuating means coacting between said frame means and said shuttle for imparting to said shuttle a two-stroke cycle of guided longitudinal traverse in the bore of the work piece, radially retractable and extensible cutting means carried by said shuttle, and means synchronizing the radial position of said cutting means with said cycle such that in one of said strokes said cutting means is in retracted position and in the other of said strokes said cutting means is in work-piece cutting position.

3,851,553

PUNCHING MACHINE

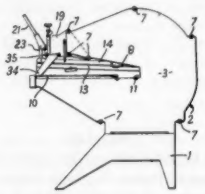
Wilfred Ernest Gale, 5 Stream Park, East Grinstead, Sussex, England

Filed Sept. 11, 1973, Ser. No. 396,188

Claims priority, application Great Britain, Sept. 18, 1972, 43120/72

Int. Cl. B26d *1/26*, *7/26*

U.S. Cl. 83—529 **8 Claims**

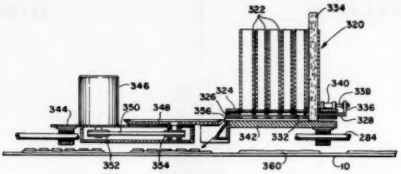


1. A machine, for punching sheet material, of the kind comprising a body defining a throat, a die carried by the body adjacent to an open end of the throat, a punch carried by a member pivoted to the body, and means acting between the body and the pivoted member for shifting the punch in relation to the die, characterised in that the body includes a pair of substantially plane sheet metal plates disposed side by side and converging towards the open end of the throat, and a plurality of tie means extending between and secured to the two plates.

3,851,554
PASTRY SHELL FILLING APPARATUS

Imre F. Papai, 2818 E. 119 St., Cleveland, Ohio 44120

Division of Ser. No. 250,933, May 8, 1972, Pat. No. 3,780,643.
This application Oct. 1, 1973, Ser. No. 402,474
Int. Cl. B26d 7/06, 7/16
U.S. Cl. 83—165 12 Claims



1. Sliced sausage dispensing means comprising in combination:

a. means for supporting an array of sausages in vertical position against

b. a supporting translatable deck whereby the lower ends of the sausages slide in supported relation over the deck when it is translated;

c. a knife wheel associated with said deck and translatable therewith;

d. means for rotating said knife wheel;

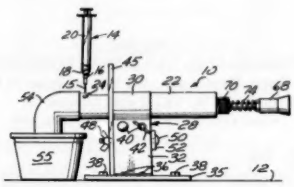
e. an opening in said deck extending under a portion of the periphery of the knife wheel at its leading edge, the leading edge of said knife wheel being located slightly above the deck by a distance corresponding to the desired thickness of sausage slices whereby severed slices drop through said opening; and

f. chute means carried beneath said deck adjacent said opening for delivering said slices to said pastry shell.

3,851,555
TOOL FOR DESTROYING HYPODERMIC SYRINGES

Harry N. Eldridge, 8110 Mission, Glen Avon, Calif. 92509, and Robert K. Eldridge, 3661 Pacific Ave., Rubidoux, Calif. 92509

Filed Nov. 23, 1973, Ser. No. 418,382
Int. Cl. B26d 3/16
U.S. Cl. 83—165 8 Claims



1. In a tool for irreversibly disabling both the needle portions and the barrel portions of disposable hypodermic syringes, the combination of:

a tube having a forward end and a rearward end;

a receptacle to receive severed parts of the hypodermic syringes;

passage means placing the forward end of the tube in communication with the receptacle;

said tube, passage means and receptacle forming a closed space to confine the severed parts of the hypodermic syringes;

the forward end of the tube having at least one aperture to receive needle portions of the hypodermic syringes and having at least one larger aperture to receive the leading ends of the barrel portions of hypodermic syringes after the needle portions are severed;

a plunger slidably mounted in the tube to cooperate with the edges of said apertures to shear the needle portions of the hypodermic syringes and to shear the leading ends of the barrel portions of the hypodermic syringes;

said plunger being manually retractable through the rear end of the tube;

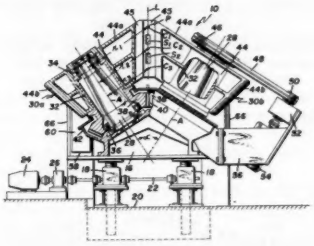
spring means to oppose retraction of the plunger and to store energy to drive the plunger through a shearing stroke; and

support means to releasably engage and immobilize the tube.

3,851,556
SHEARING APPARATUS

Donald Sieurin, Northboro, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Mar. 19, 1974, Ser. No. 452,664
Int. Cl. B23d 19/04; B26d 7/06
U.S. Cl. 83—311 8 Claims



1. An apparatus for subdividing an axially moving elongated product into a plurality of equal length sections, comprising: a pair of cutting blades mounted on opposite sides of the path travelled by the product, said cutting blades being rotatable about non-parallel axes and being arranged to effect a cutting action on the product passing therebetween, the said cutting action occurring along a reference line which intersects said path and which bisects the angle included between said axes; and drive means for rotating said cutting blades about said axes, said drive means being adjustable to equate the peripheral speed of the blade portions cutting the product with the linear speed of the product, whereupon the length of the resulting subdivided sections will vary depending upon where said path intersects the said reference line.

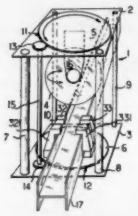
3,851,557
CUTTING APPARATUS WITH WORK CLAMP

Jean Vierstraete, 83, rue Victor Hugo, 62 Oignies, France

Filed Nov. 1, 1973, Ser. No. 412,045
Int. Cl. B23d 47/04
U.S. Cl. 83—453 7 Claims

1. Cutting apparatus capable of producing an oblique transverse cut in an elongate workpiece, comprising a frame supporting a circular saw rotatable about a horizontal axis, and an angularly movable device for locating and clamping the workpiece in horizontal and vertical directions, the saw being movable about its diametral vertical axis which is perpendicular to and intersects with the longitudinal axis of the workpiece in the cutting position, the clamping device comprising at least one set of jaws with fixed clamping surfaces, means being provided for coordinating angular movement of the clamping device and the saw so that, even with large cutting angles, the saw is always located as near as possible to the set

of jaws, said jaws being movable independently to clamp the workpiece, after the saw and jaws have been adjusted into the



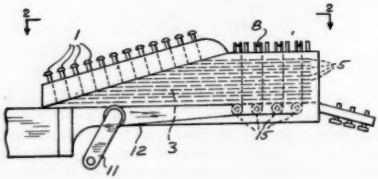
required attitude for a desired angle of cut, without causing any rotation or deformation of the workpiece.

3,851,558

MECHANICAL CHORD FRETTER FOR FRETTED INSTRUMENTS

Nigel J. Hopkins, Ottawa, Ontario, Canada, assignor to The Raymond Lee Organization Inc., New York, N.Y.

Filed Aug. 16, 1973, Ser. No. 389,022
Int. Cl. G10d *3/00*
U.S. Cl. 84—317 **4 Claims**



1. A mechanical chord fretter for use with a string carrying fretted finger board of a musical instrument such as guitar, said fretter comprising:

a housing detachably engagable with the board;

a plurality of plunger assemblies in the housing, each assembly when actuated being pressed down upon a selected string at a selected fret to fret a note, a chord being fretted when the particular assemblies associated with the particular notes in the chord are pressed down simultaneously;

a plurality of slidable cards in the housing, each card being associated with a separate chord, each card being individually slidable between a normal first position remote from the assemblies and a second position at which it engages the assemblies, each card when in the second position selecting for actuation the assemblies defining the notes in the chord associated with the said each card;

a plurality of normally raised push buttons in the housing, each push button being associated with a different card and the card associated therewith, each push button, when depressed, causing its associated card to be slid from its first to its second position; and

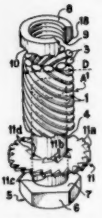
manuable operable lever means in the housing having a first position at which the assemblies selected for actuation are actuated and the appropriate chord fretted, said lever means having a second position at which the card then in its second position is returned to its first position.

3,851,559

EXPANSIBLE ELEMENT FOR AN ASSEMBLING DEVICE AND DEVICES INCLUDING SAID ELEMENT

Lucien Louis Baude, Le Vesinet, France, assignor to Etablissements Joints, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 91,428, Nov. 20, 1970, abandoned. This application Oct. 5, 1972, Ser. No. 295,325
Claims priority, application France, Nov. 26, 1969, 69.40780; Great Britain, Nov. 17, 1970, 54704/70
Int. Cl. F16b *13/06*
U.S. Cl. 85—64 **10 Claims**



1. Assembling device comprising, in combination, a tubular expansible cluster of a plurality of juxtaposed identical filaments having a circular cross-section, said cluster having an axis and two opposed ends and being defined by two coaxial and concentric geometrical envelope-surfaces, one of which surfaces is an outer surface and the other an inner surface, the filaments being of a resiliently flexible crush-resistant material, each filament having the shape of a helix whose axis coincides with the axis of said cluster and extending through at least two thirds of a complete turn of its helix, all the contact lines between adjacent filaments being contained in a single geometrical surface coaxial with said cluster and located between said envelope-surfaces, whereby the filaments are temporarily held together owing to their very helical shape, and means for exerting an axial force of compression on said element, said force exerting means comprising two members having transverse bearing faces perpendicular to said axis of the cluster and capable of bearing against ends of the filaments at said opposed ends of the cluster.

3,851,560

SELF-DRILLING EXPANSION ROOF BOLT

Jeffrey R. Yago, Huntington, W. Va., assignor to Clifford T. Deane, Charltston, W. Va., a part interest

Filed Oct. 2, 1972, Ser. No. 294,267
Int. Cl. F16b *13/06*
U.S. Cl. 85—68 **9 Claims**

1. A self-drilling expansion roof bolt, comprising, in combination:

a. a member;

b. means mounted on the member for making a hole; and

c. means for anchoring the member in a hole, the hole making means making a hole when the member is rotated about an axis of rotation in a one direction, and the anchoring means anchoring the member in a hole when the member is rotated about the axis of rotation in a reverse direction to the one direction, the anchoring means including an expansion shell, a wedge portion arranged for selective engagement with the expansion shell, and means for engaging the wedge portion with the expansion shell and expanding the latter by a rotation of the member in the reverse direction, the engaging means including external screw threads, and a drive nut having internal screw

threads threadingly engaged with the external screw threads and jaw elements provided on an outer periphery of the nut for engaging only in the reverse direction of rotation of the member with walls defining the hole.

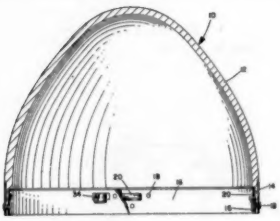
3,851,561
FAIRING, ROCKET LAUNCHER

Pasquale Rudolph Zagala, Ridgecrest; Bill Moore, Inyokern, both of Calif., and Vincent J. Taylor, deceased, late of China Lake, Calif. (by Wayne George Zellmer, executor), assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 22,464, March 25, 1970, abandoned. This application May 4, 1973, Ser. No. 357,403

Int. Cl. F41f *3/04*

U.S. Cl. 89—1.8 **14 Claims**



1. A rocket launcher fairing for use with an elongated rocket launcher, said fairing comprising a hollow shell having a rounded streamlined surface, said shell being open at one end and formed of a low-density frangible material, an annular rim conforming substantially to said shell opening, said rim being secured to the inner hollow surface of said shell, and securing means mounted on said rim, said securing means including a latching aperture in said annular rim and a resilient latching means secured to said rim and extending into said aperture for engagement with complementary securing means on said rocket launcher, the securing means also including tabs adapted to engage the complementary securing means on said rocket launcher, and wherein said fairing shell includes cutout portions over said annular rim, said latching means protruding radially outwardly from said rim into said cutout portion, the outermost protrusion of said latching means being recessed from the outer streamlined surface of said shell, said open end of said shell formed to accommodate the end of said rocket launcher such that said securing means engages said rocket launcher for detachable affixation of said fairing to said launcher.

3,851,562
TOOL MOUNTING DEVICE FOR A MACHINE TOOL

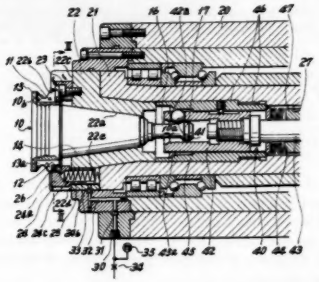
Tamaki Tomita, and Yoshiki Ochiai, both of Okazaki, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Mar. 1, 1973, Ser. No. 337,178

Claims priority, application Japan, Mar. 6, 1972, 47-23022

Int. Cl. B23b *31/10*

U.S. Cl. 20—11 A **6 Claims**



1. A device for mounting a working tool on a machine having a spindle head, a tool magazine for removably storing diverse tools, and tool transfer means for transferring the respective diverse tools between said spindle head and said tool magazine, comprising:

a spindle rotatably mounted within said spindle head, said spindle being provided with a fixed driving key means at one end thereof;

tool holding means for holding each of said diverse tools;

engaging means provided on said tool holding means and including an arcuate recess on the peripheral portion of said tool holding means;

locking means for clamping said tool holding means in said spindle in axial alignment therewith;

positioning means reciprocably mounted in said one end of said spindle and engageable with one of said engaging means for orienting another of said engaging means to said fixed driving key means in course of the relative rotation between said spindle and said tool holding means before said another of said engaging means is engaged with said fixed driving key means; and

pushing means arranged in said spindle for urging said positioning means into such a position that said positioning means protrudes a predetermined amount further than said fixed driving key means from said one end of said spindle and for entering said positioning means into said arcuate recess before said another of said engaging means is oriented to said fixed driving key means.

3,851,563
MACHINE TOOL

Robert Habib, 3 Rue de Beaumont, Geneve, Switzerland (1200)

Filed June 29, 1972, Ser. No. 267,616

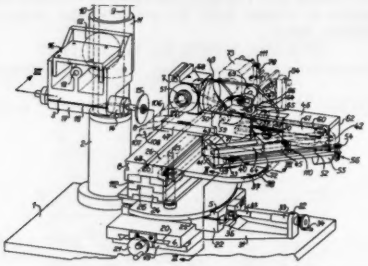
Claims priority, application Switzerland, June 30, 1971, 9576/71; June 15, 1972, 8921/72

Int. Cl. B23c *3/32*

U.S. Cl. 90—11.5 **3 Claims**

1. A machine for machining workpieces, including spiral cylindrical cutters with hemispherical heads, comprising: a machine tool carrier, a machine tool rotatable about an axis, means for mounting said machine tool on said machine tool carrier and for horizontally orienting and inclining said axis; a generally horizontal carriage; means for setting the position

of the carriage relative to the machine tool carrier in a generally horizontal plane, a support mounted on the carriage for rotation and inclination respectively about a vertical axis and a horizontal axis, a headstock including a rotatable spindle to support a workpiece to be machined, the headstock being slidably mounted on the support along a direction parallel to



the axis of the spindle, the axis of the spindle being disposed to intersect said vertical axis with said intersecting axes defining a plane perpendicular to the horizontal axis, and a device mounted on the support for helicoidally driving the headstock spindle in response to the sliding movement of the headstock along the support.

3,851,564

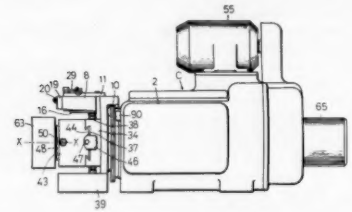
PORTABLE SCREW CUTTING MACHINE

Yoshizo Kitano, 78, 2-Chome Daimon Chikusa Ku, Nagoya, Japan

Continuation-in-part of Ser. No. 217,894, Jan. 14, 1972, abandoned. This application Nov. 26, 1973, Ser. No. 419,209

Int. Cl. B23g *1/02, 1/24*

U.S. Cl. 90—11.52 **15 Claims**



1. A portable screw cutting machine comprising in combination a box frame,

a hollow shaft having an axial centerline,

means supporting said hollow shaft on said box frame,

means for axially moving said hollow shaft with respect to said box frame in one direction to and away from a stationarily positioned workpiece, said workpiece having a centerline in axial alignment with said axial centerline of said hollow shaft,

means for rotating said hollow shaft at a relatively low speed about its longitudinal axis,

a cutting tool holder, said cutting tool holder having an axial centerline,

a recessed portion formed in said cutting tool holder,

at least one radially disposed cutting edge supported within said recessed portion adjacent an outer end of said cutting tool holder,

means connecting said cutting tool holder adjacent one end of said hollow shaft for axial and rotatable movement therewith, said connecting means comprising adjustable means to adjustably position said cutting holder with respect to said hollow shaft so that the axial centerline of said cutting tool holder angularly deviates from the axial centerline of said hollow shaft in a radial pattern from a point spaced inward from said hollow shaft toward the end of said hollow shaft in juxtaposition to said workpiece to thereby adjust the angular disposition of said cutting tool with respect to said workpiece,

means connected with said adjustable means for rotating said cutting tool holder at a speed relatively higher than the speed of rotation of said hollow shaft to orbitally revolve said cutting tool edge around said workpiece,

means supported on said box frame and operably associated with said shaft rotating means for axially moving said hollow shaft toward said workpiece with said workpiece received in said cutting tool holder recess to thereby move said cutting tool along the portion of the length of said workpiece while said cutting tool revolves around said workpiece,

means adjustably supported on said box frame for setting the distance of axial movement of said hollow shaft in said one direction, said last stated means comprising means to stop said hollow shaft in its axial movement when said hollow shaft has traveled said distance in said one direction,

means supported on said cutting tool holder means for moving said cutting tool out of contact with said workpiece when the axial movement of said hollow shaft in said one direction has been stopped,

means supported on said box frame and engaged with said hollow shaft for axially moving and resetting said hollow shaft in a second direction back to its initial position after said cutting tool has been moved out of contact with said workpiece.

3,851,565

SERVO-BOOSTERS FOR VEHICLE BRAKE SYSTEMS

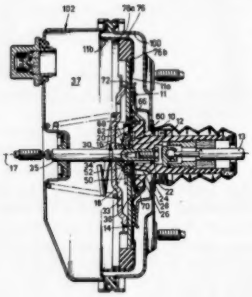
John James Camm, East Malvern, Australia, assignor to Girling Limited, Birmingham, England

Filed Aug. 14, 1972, Ser. No. 280,167

Claims priority, application Great Britain, Aug. 13, 1971, 38063/71

Int. Cl. F15b *9/10*

U.S. Cl. 91—369 B **2 Claims**



1. A differential-pressure operated servo booster of the type having a load actuating member which is displaceable by the application of differential fluid pressure across an annular elastic diaphragm, comprising a housing, a diaphragm dividing the housing into two chambers, valve means located coaxially of the booster axis for controlling the relative pressure in said two chambers, a plurality of rigid, individual, radially extend-

ing fingers which define a radially slotted annular deflecting plate, an annular skirt member located coaxially within the housing and having an axially extending portion and a radially inwardly projecting portion, the diaphragm having a first portion which extends generally radially outwardly of the booster axis and a second, axially extending portion which is located radially outwardly of the deflecting plate and which is supported by said axially extending portion of the annular skirt member and the radially inwardly extending portion of the annular skirt member including a first radially inwardly extending limb which is engaged by that side of each of the fingers which faces towards said valve and at least one second radially inwardly extending limb which engages the other side of at least some of the fingers and wherein said second limb is axially spaced from said first limb and extends radially inwardly from the axially extending portion of said skirt.

3,851,566

APPARATUS FOR CONTROLLING A HYDRAULIC-LIFT TAIL GATE ARRANGEMENT OF A CARGO-CARRYING VEHICLE

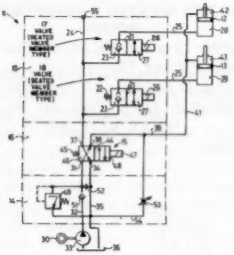
Walter Herrmann, Vaihingen/Enz, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 12, 1973, Ser. No. 422,595

Claims priority, application Germany, Jan. 13, 1973, 2301648

Int. Cl. F15b *11/16*

U.S. Cl. 91—411 R **18 Claims**



1. A hydraulic control apparatus comprising, in combination, a double-acting consumer having a first work conduit for receipt of pressure fluid to cause said consumer to effect movement of a load in a first direction and having a second work conduit for receipt of pressure fluid to cause said consumer to effect movement of such load in opposite second direction; a tank; a supply conduit and a pump for pumping fluid from said tank into said supply conduit; a preselector valve having a first port connected to said supply conduit, a second port connected to said tank, a third port and a fourth port connected to said second work conduit of said double-acting consumer, said preselector valve having a first position in which fluid communication is established in said preselector valve between said first and fourth ports and also between said second and third ports and having a second position in which fluid communication is established in said preselector valve between said first and third ports and also between said second and fourth ports; a control valve having a first port connected to said first work conduit of said double-acting consumer and having a second port connected to said third port of said selector valve and having a first position in which fluid communication between said ports of said control valve in said control valve is blocked and having a second position in which fluid communication between said ports of said control valve in said control valve is established; and pressure-regulating means connected between said fourth port of said preselector valve and said tank and operative for regulating the fluid pressure in said second work conduit.

3,851,567

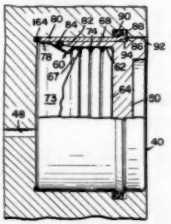
BRAKE MECHANISM

Tom H. Thompson, 29210 Point O'Woods Pl., Southfield, Mich. 48075

Continuation-in-part of Ser. No. 7,381, Feb. 3, 1970, abandoned, which is a continuation of Ser. No. 692,218, Dec. 20, 1967, abandoned. This application Mar. 30, 1970, Ser. No. 23,699

Int. Cl. F16j *3/00*

U.S. Cl. 92—42 **16 Claims**

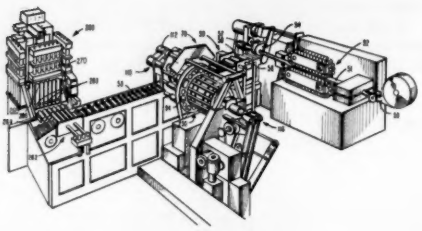


1. Hydraulic brake apparatus comprising: a housing having a cavity formed therein with a closed end and an open end; a port in said closed end for connection with a source of fluid pressure; a fluid pressure transmitting member mounted in said cavity and forming with said cavity a fluid pressure chamber, said fluid pressure transmitting member comprising a metallic cup-like actuator having an open end portion and a closed end portion spaced from and movable with respect to each other; said actuator having mounting flange means secured to the open end portion thereof; means defining a mounting groove in said housing receiving said mounting flange means; static, resilient sealing means between the surfaces of said mounting groove and said mounting flange; said flange means compressing said sealing means between the surfaces of said mounting flange means and mounting groove to form a static, fluidtight seal between the actuator and the closed end of the cavity such that the open end portion of the metallic actuator is secured to the cavity in fixed, fluid tight relationship with respect to the closed end of the cavity and the closed end portion of the metallic actuator defines a fluid pressure responsive movable wall for said chamber and is operable to apply braking pressure when fluid pressure is applied to said chamber from said source; said open and closed end portions of said metallic actuator being spaced from each other by an endless side wall extending therebetween; said side wall being formed with a deformable corrugated metallic segment for changing the length of the side wall and hence the spacing between said open and closed end portions, said corrugated segment being plastically deformable in response to the application of fluid pressure to said chamber to prevent the side wall from returning to its original length when the fluid pressure is subsequently relaxed so that the relaxed length of the metallic actuator changes progressively with the successive application and relaxation of fluid pressure to said chamber; said metallic actuator being statically sealed only to said housing and being free of any sliding sealing relationship therewith.

3,851,568
FOLDABLE TUBULAR PACKAGE APPARATUS

George Henry Holoubek; David Edward Ales; Harland Elmer Harms; Warren E. Erickson; Maurice A. Ditmars, and J. Keith Brookhart, all of Muscatine, Iowa, assignors to Dart Industries Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 376,725, July 5, 1973, which is a continuation of Ser. No. 214,654, Jan. 3, 1972, abandoned.
This application Sept. 14, 1973, Ser. No. 397,460
Int. Cl. B31b *1/32*
U.S. Cl. 93—36.8 13 Claims



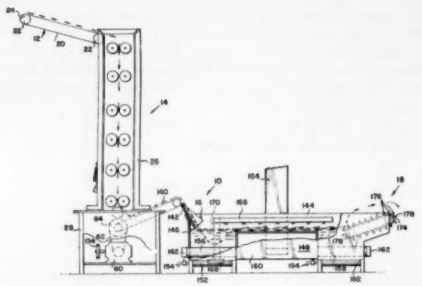
1. In an apparatus for producing a foldably settable tubular container comprising:
   a first shaft;
   a carriage means mounted on said first shaft having arranged thereon a plurality of mandrels adapted to receive tubular blanks;
   a second shaft adjacent said first shaft;
   a forming assembly positioned on said second shaft adjacent said carriage means for cooperating with said mandrels to shape an end of said tubular blanks, said forming assembly including a first means for crimping the ends of said blanks, a second means for twisting the crimped ends of said blanks, and a third means for pressing the twisted crimped ends of said blanks into an inverted frusto-conical shape including a die member having an end portion that has an inverted annular frusto-conical configuration with a central recess and a matching mandrel die head having a central pin with an annular recess about the base of said pin in substantially matching conformity with the end portion of said die member.

3,851,569
APPARATUS FOR MAKING SOPAIPILLAS AND THE LIKE

Raymond Madrid, 922 Coal Ave., Albuquerque, N. Mex. 87102

Filed Aug. 19, 1971, Ser. No. 173,061
Int. Cl. A47j *37/12*
U.S. Cl. 99—407 17 Claims

1. An apparatus for making sopaipillas and the like including:
   a. a plurality of linearly spaced pairs of opposed roll members, the periphery of each set of roll members in a given pair being spaced from each other so as to engage and pass a strip of dough therebetween,
   b. the surfaces of successive pairs of roll members moving at greater pheripheral velocities to contract, squeeze and stretch the dough strip moving therebetween under tension and at a progressively greater speed,
   c. air supply means adjacent each of the roll members for supplying a continuous stream of air along the periphery of each roll member for maintaining the entire periphery thereof in a dry condition and thereby preventing particles of the strip of dough from sticking to the roll members,
   d. means for cutting dough sections from the lengthened strip of dough after the dough strip has passed through the plurality of linearly spaced pairs of opposed roll members,
   e. an elongated bath of heated cooking oil contained in an elongated receptacle into which the cut dough sections are dropped at one end of the receptacle,

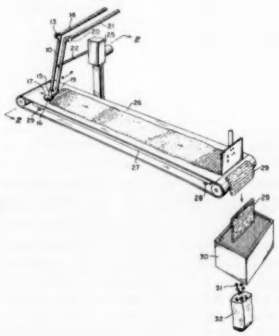


   f. means for moving the dough sections through the bath of heated cooking oil from said one end of the receptacle to the far end thereof,
   g. means for removing the cooked dough sections from the bath of heated cooking oil at the far end.

3,851,570
APPARATUS FOR MAKING A MARBLED MEAT PET FOOD

Wayne M. Charter, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Division of Ser. No. 57,092, July 22, 1970, Pat. No. 3,765,902.
This application Mar. 1, 1972, Ser. No. 231,054
Int. Cl. A21c *3/06*
U.S. Cl. 99—450.2 1 Claim



1. An apparatus for producing a substantially solid semi-moist animal food resembling marbled meat, said apparatus comprising a first pipe, said first pipe having an entrance end and an outlet end, said outlet end of said first pipe being substantially closed and said first pipe having a plurality of openings adjacent to the substantially closed outlet end, the area of opening of each of the plurality of openings being smaller than the cross-sectional area of the interior of the first pipe, a second pipe, said second pipe having a discharge port,

entrance end and inner cavity, said inner cavity of said second pipe completely enclosing said outlet end of said first pipe with said outlet end of said first pipe being substantially within said inner cavity, said entrance end of said second pipe being sealed to said entrance end of said first pipe to form a continuous sealed cavity from said entrance of said second pipe to said inner cavity; means for supplying the first pipe and the second pipe with different colored semi-moist animal food, said means being respectively connected to the entrance end of each pipe; an endless conveyor for receiving and cooling a product, said endless conveyor being located underneath said discharge port of said second pipe; and means for moving said first pipe and said second pipe back and forth across the endless conveyor.

3,851,571
APPARATUS AND METHOD FOR ENCAPSULATING EGGS

John Francis Nichols, Evergreen Park, Ill., assignor to Nichols Products, Inc., Chicago, Ill.

Filed Aug. 28, 1972, Ser. No. 284,123
Int. Cl. A21c *9/06*
U.S. Cl. 99—450.6 **3 Claims**

1. An egg encapsulating apparatus separating egg white and egg yolk for freezing to maintain the appearance of a fresh egg upon subsequent cooking comprising

container means formed in the shape of a portion of an egg shell for containing a first liquid therein,

separating means enclosing said container means to form an enclosure of a first liquid contained therein,

said separating means having formed therein a protrusion in the shape of a portion of an egg yolk for containing a second liquid, said protrusion extending into the enclosure formed with said container means, and

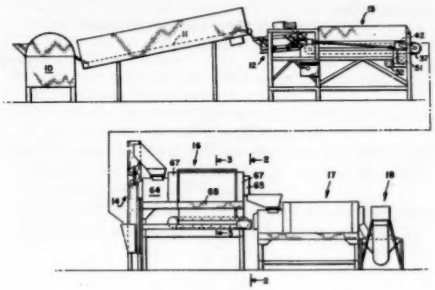
means for enclosing the protrusion formed in said separating means.

3,851,572
DRY PEELING APPARATUS

Louis P. Lazzarini, San Jose, Calif., assignor to Genevieve I. Hanscom, Santa Cruz, Calif.; Genevieve I. Hanscom; Robert Magnuson and Lois J. Thomson, Trustees of the Estate of Roy M. Magnuson; a part interest to each

Division of Ser. No. 299,760, Oct. 24, 1972, , which is a continuation-in-part of Ser. Nos. 826,377, May 21, 1969, abandoned, and Ser. No. 42,925, June 3, 1970, abandoned, Continuation of Ser. No. 148,410, June 1, 1971,. This application Aug. 6, 1973, Ser. No. 385,845
Int. Cl. A23m *7/02*
U.S. Cl. 99—451 **4 Claims**

1. In an apparatus for peeling fruit and vegetables having means for applying lye to the articles as a preliminary treatment; means for treating the articles as a preliminary treatment; means for treating the articles with infra-red rays comprising a feed mechanism for arranging articles treated with lye in rows, a roller conveyor for receiving rows of articles from the feed mechanism and for turning the articles as they are progressed thereby, and a source of infra-red rays disposed in overhead relation to said roller conveyor; and a peeler for receiving articles from said infra-red ray treating means comprising a cylindrical array of peeling rolls, each roll including resilient fingers projecting radially outwardly from the roll, a rotatable housing having said array of rolls disposed therein

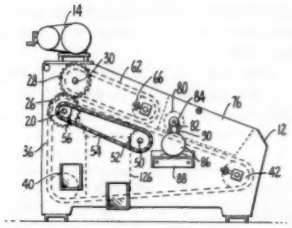


and being substantially coextensive in length with said rolls to receive pieces of peel and debris removed by said fingers and flung onto said housing, and means for removing peel and debris from said housing.

3,851,573
CHERRY STEMMING MACHINE

Earl J. Hesse, Oakland; Frederick J. Cimperman, San Lorenzo, and Howard B. Severson, San Leandro, all of Calif., assignors to Vistan Corporation, San Leandro, Calif.

Filed Sept. 13, 1972, Ser. No. 288,505
Int. Cl. A23n *15/02*
U.S. Cl. 99—640 **7 Claims**



1. A machine for stemming fruit comprising:

a frame,

a loading hopper mounted on the frame for receiving fruit for processing,

a plurality of feed bars having pockets provided therein for receiving individual fruit from the hopper,

endless chain means attached to said feed bars for driving the feed bars,

a feed brush for sweeping fruit from the tops of the feed bars as they leave the loading hopper and for brushing fruit stems extending from the pockets down against the tops of the feed bars,

holding means for holding the fruit stems down against the top of the feed bars,

stem gripping means for gripping fruit stems against the tops of the feed bars and suspending the fruit below the feed bars,

retaining means for retaining fruit in the pockets until engaged by the stem gripping means,

means for preventing fruit suspended below the feed bars from re-entering the pockets, and

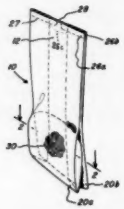
stemming means for removing fruit suspended below the feed bars from their stems.

3,851,574

HEAT AND MOISTURE ACTIVATED SAVORY COATING SYSTEM FOR POPCORN

Morris H. Katz, and Lawrence C. Brandberg, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Dec. 26, 1972, Ser. No. 318,349
Int. Cl. B65b *25/16*
U.S. Cl. 426—107 6 Claims



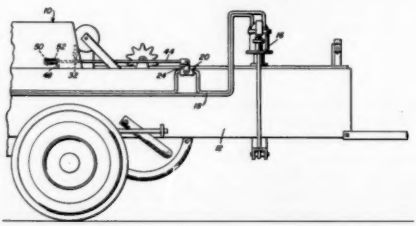
1. A package of popcorn ready for popping in a microwave oven comprising an expandable package formed from a flexible sheet material transparent to microwave energy, said package having at least one steam exhaust opening therein of sufficient size to allow the exhaust of gas and steam without bursting the package, a charge of unpopped corn in the package and from about one to eight parts of a dispersion of an edible fat and an edible hydrophillic and thermoplastic film former by weight for each eight parts by weight of corn, said dispersion comprising sufficient edible fat whereby when the package is placed in said oven, the corn will be popped and simultaneously coated with the dispersion.

3,851,575

BALER WIRE TENSION CONTROL ASSEMBLY

Joe Cardoza, Dos Palos, Calif., assignor to John R. Cardoza, Dos Palos, Calif.

Filed Aug. 23, 1973, Ser. No. 390,860
Int. Cl. B65b *13/18*; B30b *15/26*
U.S. Cl. 100—4 6 Claims



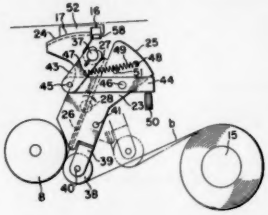
1. A tension control assembly for balers wherein bales are progressively tied with the baling wire passing between a finished bale and the next bale being formed, said baler including a bale chamber, hydraulic pressure means selectively varying the size of the bale chamber, a valve control for said pressure means, a knotter, and a wire path extending from a roll supply about the leading end of a new bale between the new bale and the last finished bale and to the knotter, said control assembly being operatively connected to said valve control for a selected actuation thereof, said control assembly being interposed along the wire path between the leading end of the new bale and the knotter for engagement by the baling wire and a sensing of the tension therein to effect a corresponding selective actuation of the pressure means valve control.

3,851,576

APPARATUS FOR HOLDING TIP OF BAND IN STRAPPING MACHINE

Yukio Takahashi, Tokyo, Japan, assignor to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1973, Ser. No. 334,855
Claims priority, application Japan, Feb. 25, 1972, 47-23202[U]
Int. Cl. B65b *13/32*
U.S. Cl. 100—33 PB 4 Claims



1. In a strapping machine for securing a flexible band in surrounding relationship to an object, such as a package, said machine including a frame having a table slidably supported thereon for movement between first and second positions, the table being adapted to have a package disposed on the upper surface thereof, clip means mounted on said frame for movement between open and closed positions, said clip means including a movable clip portion disposed for coaction with the undersurface of said table for holding the leading end of a band therebetween when said clip means is in said closed position, means associated with said table and disposed at least partially thereunder for feeding said band upwardly to make a loop surrounding the table and a package thereon, drive means for controlling the slidable movement of said table between said first and second positions, said drive means including a rotatable shaft and linkage means coacting between said shaft and said table, means coacting with the band for melting the opposing surfaces thereof and for causing the opposing melted surfaces to be overlapped and pressed together to create a bond therebetween, and control means coacting with said clip means for controlling the opening and closing thereof, comprising the improvement wherein said control means includes link means coacting directly between said shaft and said clip means for controlling the opening and closing thereof.

3,851,577

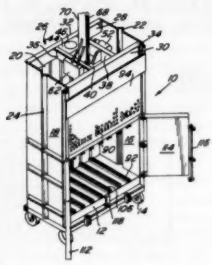
VERTICAL BALER

William F. Newcom, Warminster, and Robert A. Munro, Southampton, both of Pa., assignors to Munro-Newcom, Inc., Southampton, Pa.

Filed Nov. 6, 1972, Ser. No. 304,162
Int. Cl. B30b *15/32*
U.S. Cl. 100—218 7 Claims

1. A baler comprising a housing having a base at the bottom thereof and defining the bottom of a baling chamber in the housing, a platen supported by the housing for movement in a vertical direction toward and away from the base, said base and platen on their juxtaposed faces having channels through which a flexible member may extend during application to confine a bale in said chamber, means at the upper end of said housing supporting a cylinder having its piston rod connected to said platen for causing movement of said platen, door means on said housing for providing access to said baling chamber, said housing having a rear wall provided with slots, each rear wall slot being aligned with a channel on said base, a plurality of flexible members each having one end secured to said base, each flexible member extending in one of the channels on the base and through the aligned slot in the rear

wall, means defining an inoperative position on the rear wall of said housing for the ends of flexible members remote from the base, and means on the last mentioned ends of said flexible



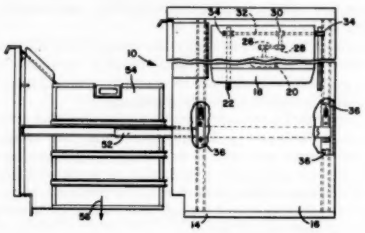
members for removably attaching the same to said platen whereby the flexible members may selectively effect ejection when the door means are open and the platen is moved to an uppermost position away from the base.

3,851,578

COMPACTOR WITH YIELDABLE RECEPTACLE

Einar O. Engebretsen, Troy, Ohio, assignor to The Hobart Manufacturing Company, Troy, Ohio

Filed Apr. 17, 1972, Ser. No. 244,454
Int. Cl. B30b *15/00, 1/18*
U.S. Cl. 100—229 A **10 Claims**



1. A compactor comprising:

a. a compactor housing,

b. a ram mounted in said housing for vertically reciprocal movement therein,

c. a slidably mounted refuse receiving drawer,

d. means supporting said drawer for translational movement between a compacting position beneath said ram and a noncompacting position displaced outwardly of said compacting position, and

e. means in engagement with said drawer supporting means for permitting limited yielding movement of said drawer under compacting movement of said ram sufficient to relieve compacting forces from said drawer supporting means.

3,851,579

CAN CARRIER TRIP MECHANISM IN CONTINUOUS CAN PRINTER

Albert T. Zurick, Glen Rock, N.J., assignor to Van Vlaanderen Container Machinery, Inc., Paterson, N.J.

Filed May 16, 1973, Ser. No. 360,831
Int. Cl. B41f *17/22*
U.S. Cl. 101—39 **4 Claims**

1. In a continuously rotating can printing or coating machine having a can support, the shaft of said can support being mounted within a bore of a continuously rotating carrier arm, the improvement of a trip mechanism to effect displacement of the can support from a print blanket comprising:

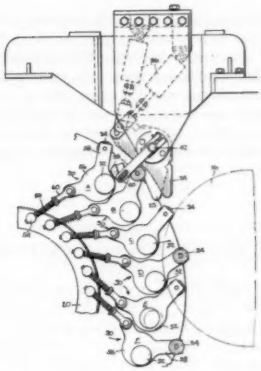
an eccentric sleeve between said shaft of said can support and said bore, said sleeve being rotatable within said bore and about said shaft, said sleeve having a normal print rotational position to hold said shaft of said can support in a position to effect contact between said can support and said print blanket,

detector means to provide a trip signal in response to the absence of a can on said can support,

a trip cam and trip cam follower pair, one of said trip pair being connected to said eccentric sleeve,

said trip cam having a normal print position and a trip position, said trip cam being thrown into said trip position in response to said trip signal,

said trip pair being positioned to engage one another when said cam is in said trip position, engagement of said trip



pair causing rotation of said eccentric sleeve by an amount and in a first rotational direction that displaces said shaft and said can support away from the print blanket to a trip position,

a spring coupled to said eccentric sleeve,

said spring tending to rotate said sleeve in said first rotational direction when said sleeve is in said trip position to hold said sleeve in said trip position and,

said spring tending to rotate said sleeve in a second rotational direction, opposite from said first rotational direction, when said sleeve is in said normal print position to hold said sleeve in said normal position,

first stop means to hold said sleeve at said trip position against further movement in said first rotational direction,

second stop means to hold said sleeve at said normal position against further movement in said second rotational direction.

3,851,580

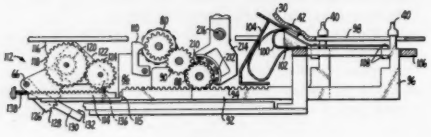
CREDIT CARD VOUCHER IMPRINTER

Quentin E. Correll, Mountain View; Allan L. Swain; Tommy A. Oudijk, both of Palo Alto; Leland D. Chamness, Mountain View, and Melvin Rudin, Los Altos, all of Calif., assignors to Albert J. Day, San Mateo, Calif.

Filed Feb. 28, 1973, Ser. No. 336,806
Int. Cl. B41l *47/46*
U.S. Cl. 101—45 **12 Claims**

1. In a credit card sales voucher imprinting device comprising: a frame; a housing mounted on the frame; means attached to the frame providing a voucher imprinting area for holding

a sales voucher for imprinting; a plurality of imprinting wheels arranged adjacent to the imprinting area; means for selectively indexing the imprinting wheels with respect to the imprinting area, the improvement comprising: a code wheel associated with each imprinting wheel, said code wheels comprising a series of wheels mounted on a common axis for rotation independent of one another; means coupling the code wheels to the imprinting wheels to rotate the code wheels about said axis so as to index each code wheel in coordination with the im-



printing wheel associated therewith; encoding means mounted on each of said code wheels to indicate the indexed position of the code wheel and, thus, the indexed position of the imprinting wheel associated therewith said means extending from the circumference of the code wheels; and, a pick-off sensor mounted relative to the frame to move in a path parallel to the common axis of rotation of the code wheels to move past the respective code wheels and sense the position of the encoding means thereon.

3,851,581

MANUFACTURE OF ELECTRICALLY HEATED WINDOWS

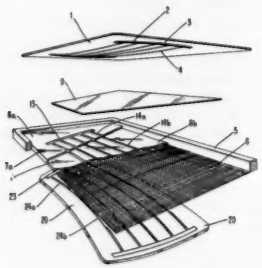
Hans Baum, Porz-Urbach; Ralf Reinicke, Porz-Zundorf, and Dieter John, Porz-Eil, all of Germany, assignors to Saint-Gobain Industries, Neuilly S/Seine, France

Division of Ser. No. 17,182, March 6, 1970, abandoned. This application Mar. 8, 1973, Ser. No. 339,313

Claims priority, application Germany, Mar. 7, 1969, 1911555; Mar. 8, 1969, 1911561

Int. Cl. B41m *1/12*

U.S. Cl. 101—129 **18 Claims**



1. A method of making a silk screen comprising a tissue and a stencil which comprises applying the emulsion to the tissue in differential thickness according to a preconceived design, and exposing the emulsion to radiation of short wave length through a transparency having opaque lines, dissolving away the areas beneath the lines and thereby making a stencil of which the slits are of differential depth conforming to the design.

3,851,582

PRINT MACHINE FOR USE WITH HIGH SOLVENT INKS

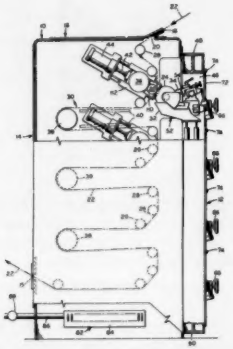
Johann Heinrich Saueressig; Josef Konen, both of Ahaus, and Paul Metges, Krefeld, all of Germany, assignors to Saueressig GmbH, Ahans/Wuellen, Germany

Filed Oct. 31, 1973, Ser. No. 411,393

Claims priority, application Germany, Dec. 21, 1972, 2262550

Int. Cl. B41f *5/16*

U.S. Cl. 101—181 **12 Claims**



1. A print machine for the continuous printing of a continuous web traveling therethrough comprising:

a. a machine frame;

b. a vertical gate member pivotally mounted on one face of said frame and movable between an open position exposing said one face and a closed position substantially closing said one face;

c. a multiplicity of pairs of cooperating print and press rolls rotatably supported on said frame in vertically spaced alignment, the print roll of each pair being disposed outwardly adjacent said gate member;

d. a multiplicity of inking units supported on said gate member in vertically spaced alignment and each cooperating with one of said print rolls for applying a coating of ink to the circumferential surface of an associated print roll as it rotates during operation of the machine, each inking unit including an ink trough and means for moving said ink trough on said gate;

e. closure means about other surfaces of said machine frame substantially closing said space defined by said frame;

f. closure members on said gate member, at least one of which is disposed between adjacent inking units and is movable between a first position substantially closing at least a portion of the vertical space therebetween and a second position exposing the vertical space therebetween, said gate with its closure members cooperating in the closed position thereof with said machine frame and closure means to provide a substantially closed housing for said print and press rolls and said ink troughs; and

g. gas vent means on said machine communicating with the interior thereof for withdrawing vapors from the interior thereof.

3,851,583

PLATE CLAMP REGISTERING MECHANISM

Robert K. Norton, Twinsburg, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

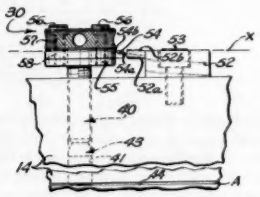
Filed Oct. 24, 1972, Ser. No. 299,662

Int. Cl. B41f *1/34*

U.S. Cl. 101—415.1 **1 Claim**

1. In a rotatable plate-carrying cylinder having a body member and a longitudinal gap in the periphery thereof which gap

is defined in part by a side surface of said body member, a plate clamp member mounted in the gap and extending longitudinally along said side surface of the gap and laterally adjustable transversely of the gap in opposite directions from a predetermined plate-receiving position spaced from said side surface of the gap toward and away from said side surface, first means for positively adjusting said clamp member away from said side surface including at least one rotatable screw threadedly engageable with said clamp member and having means associated therewith contacting said side surface so that upon rotation thereof said clamp member moves away from said side surface, second means for continuously urging said clamp member toward said side surface in opposition to said screw, plate-registering elements mounted on said clamp member for approximately registering a flexible plate having cooperating plate-registering elements to the clamp member when it is located in said predetermined plate-receiving position, and means for accurately locating said clamp member in said predetermined position comprising an indicator means carried by said screw and rotatable therewith and located in a predetermined angular position of said screw when said clamp member is in its predetermined plate-receiving position, said screw being rotatable in a first direction from said predetermined position to move the clamp away from the side surface and rotatable from said predetermined position in the opposite direction to permit the second means to move the clamp toward the side surface, said first and opposite directions thus providing movement of said plate and clamp member from approximate registering position as provided by said plate-registering elements transversely of the gap to a final position accurately registering said plate to said cylinder, and said indicator means, upon subsequent removal of said plate and rotation of the screw back to said predetermined position, providing by means of its angular position a visual indication that said clamp member has been accurately restored transversely of the gap to its said original predetermined plate-receiving position, adjusting means releasably securing said indicator means to said screw so that when released said indicator means may be angularly moved with respect to said screw and when secured to said screw rotates therewith, said at least one screw member having a threaded stem portion threadedly engaged with said clamp member and a head thereon located within said gap, and said adjusting means including means for releasably clamping said indicator means to said head to locate said indicator means within said gap, said indicator means comprising an indicator member having an opening therethrough, the stem of said screw member extending through said opening, and said means for releasably clamping said indicator member to said head comprising a clamp ring located on the side of said indicator member opposite the side adjacent said head and fastener means extending through said opening in said indicator member for securing said clamp ring, said indicator member and said head together and when released enabling said indicator member to be angularly moved relative to said screw member, clamp ring and head.



3,851,584

CHEMICAL REPRODUCTION SYSTEMS

Frank M. Palermiti, Pittsford, and Eugene P. Goldberg, Rochester, both of N.Y., Carl W. Melton, Columbus, Ohio, assignors to Xerox Corporation, Rochester, N.Y.

Filed July 10, 1970, Ser. No. 54,023

Int. Cl. B41m *5/00*

U.S. Cl. 101—470 **2 Claims**

1. A method for chemical reproduction of images by a chromogenic reaction of an iodate, an iodide, an acid, and starch comprising the steps of:

distributing finely divided iodate crystals in conformance with an image on a master sheet;

at least partially transferring the iodate crystals in image configuration to the surface of a copy sheet, said copy sheet containing starch, an alkali metal iodide, and an acid therein, to form a latent image on said sheet; and,

contacting said sheet with steam to thereby develop color on said copy sheet in conformance with the latent image.

3,851,585

BOOSTER DEVICE

Arthur Huggins, Essendon, and Darrell Andrew Williams, West Heidelberg, Victoria, both of Australia, assignors to ICI Australia Limited, Melbourne, Victoria, Australia

Filed Feb. 26, 1973, Ser. No. 336,076

Claims priority, application Australia, Mar. 8, 1972, 8205/72

Int. Cl. C06c *11/00*

U.S. Cl. 102—24 R **6 Claims**

1. In a known device comprising a sensitive secondary high explosive composition of matter capable of reinforcing a detonation wave from a primary explosive or detonating means and commonly referred to as a booster, and wherein said composition of matter is shaped so that there is provided within said composition of matter one or more apertures, the combination thereof with one or more flexible resilient restraining members which restrict the movement of detonating fuse material or blasting cap material disposed within said aperture, at least a part of said restraining member or members being embedded in the body of said composition of matter, the remainder of said member or members being disposed within said aperture in a flexible resilient condition.

3,851,586

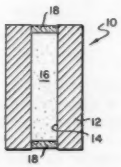
TEMPERATURE COMPENSATED PYROTECHNIC DELAYS

Warren C. Eller, and Frank J. Valenta, both of La Plata, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 15, 1973, Ser. No. 360,487

Int. Cl. F42b *3/10*

U.S. Cl. 102—27 R **8 Claims**



1. A temperature-compensated pyrotechnic delay system comprising:

a containment member;

first pyrotechnic means within said member;

an easily ignited, faster-burning, exothermic second pyrotechnic means within said member; and

ignition means to initiate a reaction in said first and said second pyrotechnic means whereby said second pyrotechnic means produces an elevated temperature condition in said delay system.

3,851,587

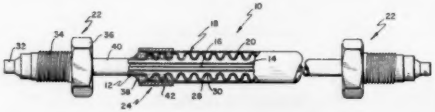
EXPLOSIVE ENERGY TRANSFER SYSTEM

Terence R. Alchorn, Santa Cruz; Werner A. Gans, Sunnyvale, and William D. Mellana, Santa Cruz, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 13, 1973, Ser. No. 424,522

Int. Cl. C06c *5/04*

U.S. Cl. 102—27 R **12 Claims**



1. An explosive-energy transfer system adapted to trigger an explosive device, comprising:

a mild detonating fuse;

a gas-impervious bellows surrounding said fuse in a longitudinal direction for an appreciable portion of the length thereof, said bellows being flexible in all directions;

a flexible sheath encasing said bellows and positioned longitudinally about said bellows in close proximity thereto;

end fittings for said bellows and sheath; and

means for hermetically sealing said bellows to said end fittings,

the flexibility of said bellows and sheath enabling the explosive energy to be routed over a tortuous path.

3,851,588

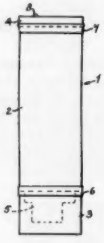
PYROTECHNIC DEVICES

Leonard Taylor, Dorking, England, assignor to Schermuly Limited, Newdigate, Dorking, Surry, England

Filed Sept. 7, 1972, Ser. No. 287,089

Int. Cl. C06d *1/10*

U.S. Cl. 102—37.8 **10 Claims**



1. A pyrotechnic article, comprising a substantially gas-tight casing provided with an opening; a pyrotechnic device interiorly of said casing; and a valve member cooperating with said casing so as to define a unidirectional flow path for a gas in a direction from the interior of said casing to the exterior thereof, said valve member comprising a body of resilient, substantially gas-impermeable material having a first portion extending through said opening with clearance, a second portion exteriorly of said casing completely overlying said opening and normally sealingly engaging said casing circumferentially of said opening, and a third portion interiorly of said casing engaging the same so as to prevent withdrawal of said body from said opening and only in part overlying the latter, said opening, said first portion and said third portion cooperating to define a passage extending from the interior of said casing to said second portion so that when the gas pressure interiorly of said casing exceeds the pressure exteriorly thereof the seal between said second portion and said casing is temporarily broken to thereby permit gas to flow through said passage from the interior of said casing to the exterior thereof until the pressure interiorly of said casing substantially equals the pressure exteriorly thereof.

3,851,589

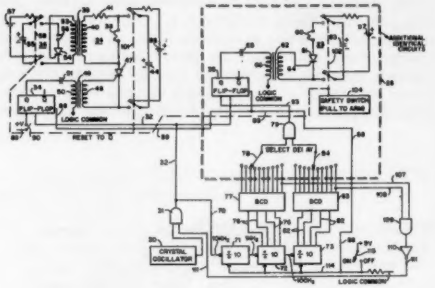
ELECTRONIC DELAY BLASTER

Herbert J. Meyer, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 25, 1973, Ser. No. 354,615

Int. Cl. F42c *13/00*; **F42d** *3/06*

U.S. Cl. 102—70.2 R **5 Claims**



1. Electronic delay blaster for detonating blasting caps for seismic energy shaping, comprising in combination

a plurality of blasting-cap circuits each having a silicon-controlled-rectifier for passing current to detonate the cap and a control circuit for initiating said current flow, a crystal oscillator for generating a continuous series of clock pulses,

an electronic flip-flop unit connected to each of said control circuits for actuating said silicon-controlled-rectifiers,

first circuit means for connecting said clock pulses to an input of each of said flip-flop units for flipping same upon receipt of the first clock pulse after each unit has been enabled,

an enabling input circuit for each of said flip-flop units,

second circuit means for applying an enabling signal to a first one of said flip-flop units for initiating a shaped seismic charge,

means for dividing said clock pulses into predetermined longer time periods between pulses,

electronic circuit means for providing a selectable series of said divided pulses for selecting a predetermined delay from the beginning to the end of said series, and

third circuit means associated with each of the remaining ones of said flip-flop units after said first for applying enabling signals in accordance with a preselected time delay for each.

3,851,590

MULTIPLE HARDNESS POINTED FINNED PROJECTILE

Nicholas Joseph LaCosta, Phoenix, Md., assignor to AAI Corporation, Cockeysville, Md.

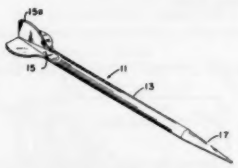
Filed Dec. 30, 1966, Ser. No. 606,454

Int. Cl. F42b *13/00*

U.S. Cl. 102—92.1 **10 Claims**

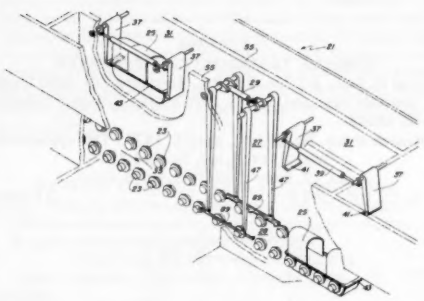
1. A one-piece projectile adapted to curl and tumble on impact with a target, comprising:

a long slim shank section,
a rear stabilizing fin section integral with said shank section, and
a tapered front section integral with said shank section,



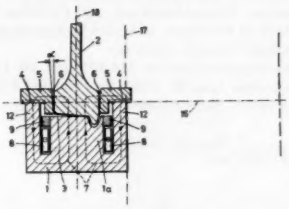
said shank, fin section, and front section being integral and of the same material,
the material of said projectile being substantially softer at its forward end zone than along a zone thereof rearward of its forward end.

3,851,591
VEHICLE TRANSFER MEANS
Jack Hickman, 5766 Fair Oaks Blvd., Carmichael, Calif. 95608
Filed Oct. 8, 1971, Ser. No. 187,796
Int. Cl. B61b *13/10, 13/12*
U.S. Cl. 104—18 **14 Claims**



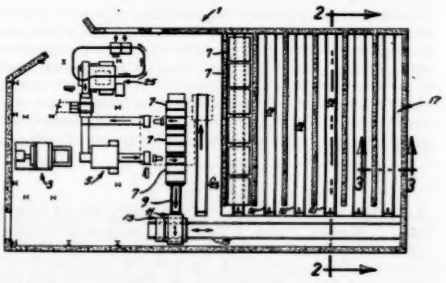
1. A vehicle transfer means for use with a continuously moving transportation system comprising
a station mounted over a portion of the drive means of said transportation system,
a vehicle transfer means disposed within said station for transferring vehicles between said transportation system and said station without interrupting the flow of traffic in said transportation system, said transfer means including a plurality of arms rotatably supported at one end in said station and connected to engagement means mounted at the other ends of said arms for engaging a vehicle, said arms being rotatable into a first position proximate said transportation system in an arc tangential to said transportation system to permit said engagement means of said arms to release a vehicle into said transportation system or to engage a vehicle moving in said transportation system, said arms being rotatable out of said first position to a second position to transfer said vehicle engaged by said engagement means to said station or to engage a vehicle for transfer from said station to said system, said arms utilizing the force of gravity to decelerate said vehicles when transferring them to said station or to accelerate said vehicles when inserting them into the flow of traffic in said transportation system, and
a roller network disposed in said station to permit movement of said vehicles in predetermined paths in and about said station.

3,851,592
APPARATUS FOR INFLUENCING THE SPEED OF TRACK-BOUND VEHICLES
Jakob Huber, Kehrsatz, and Adolf Egloff, Ittigen, both of Switzerland, assignors to Adolf Egloff, Ittigen (Canton of Berne), Switzerland
Filed Jan. 26, 1973, Ser. No. 327,122
Claims priority, application Switzerland, Feb. 3, 1972, 1631/72
Int. Cl. B61b *1/00*
U.S. Cl. 104—26 A **15 Claims**



1. An apparatus for influencing the speed, especially for braking, track-bound vehicles by means of magnetic fluxes which are conducted into the vehicle wheels and which are determined by electrical excitation currents, the improvement comprising a track rail having a flux cross-over surface which is at least half as wide as the travelling surface of the wheels so that it is effective as a pole for guiding the magnetic flux from and to the relevant wheel, and conductors for the excitation of the magnetic flux arranged parallel to a plane common to both rails of the track, said conductors being connected together into coils in such a manner that the axes thereof are located in the space beneath the plane defined by the upper edge of the track rails or externally of both vertical planes which extend through the edges of both track rails situated closest to the track axis.

3,851,593
CONCRETE BLOCK PLANT
Pierre Gagnon, 5637 Wilderton Ave., and Pierre LaForest, 1945 Bruxelles St., both of Montreal, Quebec, Canada
Filed Aug. 27, 1973, Ser. No. 390,608
Int. Cl. B65g *35/00*
U.S. Cl. 104—88 **7 Claims**



1. A transportation system having a first carrier for carrying a load; a second carrier for carrying the first carrier; means for moving the second carrier between two or more positions,

means for moving the first carrier on or off the second carrier at each position; cable means for supplying power from the second carrier to the first carrier when on or off the second carrier, first track means at each position for receiving the first carrier, second track means between the positions receiving the second carrier, third track means on the second carrier for receiving the first carrier, means on the second carrier for locking it at each position with the third track means on it aligned with the first track means, and wherein that portion of the first track means at each position, adjacent each position, is loose so it can be adjusted vertically and gauge-wise relatvive to the second track means to facilitate alignment.

3,851,594

ELECTROMAGNETIC SUSPENSION AND GUIDE SYSTEM FOR SUSPENDED VEHICLES ADAPTED TO SWITCH TRACKS

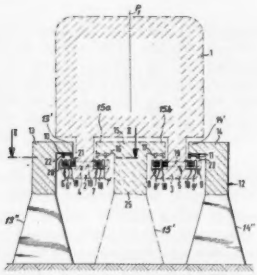
Peter Schwarzler, Furstenfeldbruck, and Christian Walkner, Dachau, both of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 324,135, Jan. 16, 1973. This application May 21, 1973, Ser. No. 362,012

Claims priority, application Germany, July 8, 1972, 2233631

Int. Cl. B61b *13/08*

U.S. Cl. 104—148 MS **8 Claims**



1. In a suspended-vehicle system comprising a track and a vehicle adapted to travel along said track and provided with force-transmitting electromagnetic means between said vehicle and said track, the improvement wherein said electromagnetic means comprises at least two electromagnet arrangements extending along and fixed to said vehicle, each of said electromagnet arrangements including two subrows of electromagnets extending in the direction of vehicle travel along said track; and armature rails mounted on said track and cooperating with each of said electromagnet arrangements respectively, the armature rail associated with each electromagnet arrangement selectively entering the field of the electromagnets of each subrow on different sides of a respectively vertical plane through the electromagnet arrangement, each of the electromagnets of each of said electromagnet arrangements being paired with an electromagnet thereof in the other subrow, said electromagnet arrangements being formed with energizing coils common to the electromagnets of each pair.

3,851,595

DAMPENED RAILWAY TRUCK BOLSTER WEAR PLATE

Claus J. Werner Clasen, Chicago, Ill., assignor to Standard Car Truck Company, Chicago, Ill.

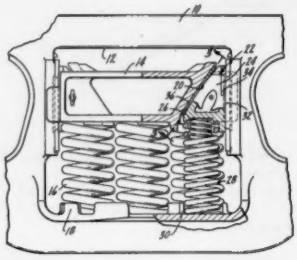
Continuation-in-part of Ser. No. 264,318, June 19, 1972, abandoned. This application Mar. 26, 1973, Ser. No. 344,508

Int. Cl. B61f *5/12, 5/50;* **F16d** *69/04*

U.S. Cl. 105—197 DB **7 Claims**

1. In a railroad car truck, a windowed side frame, a bolster extending through the window, a wedge pocket in said bolster having an upwardly and outwardly inclined floor, a stabilizing wedge in the pocket, spring means biasing the wedge upwardly into the pocket,

said wedge pocket having spaced stops along the bottom of the pocket floor, said wedge pocket having a pair of spaced angularly disposed stops adjacent the top corners of said pocket floor,



a wear plate positioned in said pocket against the pocket floor, said wear plate having converging sides forming a tapered upper edge, a centrally positioned weld between the bottom edge of said wear plate and said pocket floor bottom intermediate said pocket floor bottom stops, and a weld between each angularly disposed stop adjacent the top of said pocket floor and a top converging side of said wear plate.

3,851,596

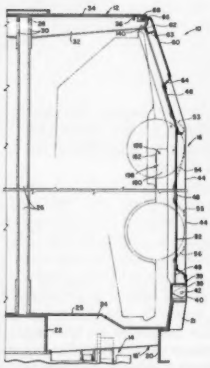
VEHICLE TRANSPORTING APPARATUS

Irving D. Ross, Jr., 736 Oak Rd., Barrington, Ill. 60007, and Thorvald Madland, 212 N. Patton Ave., Arlington Heights, Ill. 60005

Division of Ser. No. 26,560, April 8, 1970,. This application May 8, 1972, Ser. No. 251,224

Int. Cl. B60p *7/08, 3/06;* **B61d** *45/00*

U.S. Cl. 105—368 R **2 Claims**



1. A vehicle transporting apparatus including at least one door assembly mounted for pivoting movement about a generally horizontal axis between a generally vertical transporting position and a generally lateral loading position, said door having an inner face, an outer face, and a peripheral edge;

at least one vehicle engaging and supporting member extending from said inner face and including movable means for positively locking the vehicles to said door assembly;

at least one latch bolt member carried by said door assembly for locking said door assembly in its transporting position;

and actuating means for substantially simultaneously operating said movable means and said latch bolt member.

3,851,597

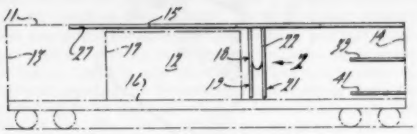
AIR BULKHEAD ASSEMBLY

Thomas G. Stone, Farmington, Mich., assignor to Evans Products Company, Plymouth, Mich.

Filed Apr. 20, 1973, Ser. No. 352,945

Int. Cl. B60p *7/14*

U.S. Cl. 105—492 **5 Claims**



1. A bracing system for a freight transporting vehicle having a cargo receiving area, said bracing system comprising a bulkhead assembly, said bulkhead assembly comprising first and second panels and inflatable air bag means interposed between said panels for varying the space therebetween, means for supporting said bulkhead assembly for movement along the cargo area to selective freight bracing positions, said bulkhead assembly being normally adapted to be positioned between respective freight load units with the panels each engaged with a respective freight load unit for retaining the load units against substantial movement, said air bag means being inflated during such use for urging the panels resiliently into engagement with the respective load units, locking means confined to a portion of said vehicle cargo area for locking said bulkhead assembly against substantial movement within said cargo area when said bulkhead assembly is not being used to brace freight.

3,851,598

FREIGHT CAR SIDE WALL CONSTRUCTION

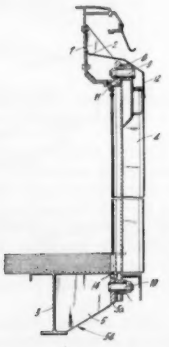
Henry Hubsch, Huettenwal-Weidenau, and Felix Schneider, Netphen-Eckmannshausen, both of Germany, assignors to Waggon Union GmbH, Siegen, Germany

Filed Mar. 18, 1974, Ser. No. 452,406

Claims priority, application Germany, Apr. 13, 1973, 2318683

Int. Cl. B61f *1/10*

U.S. Cl. 105—409 **4 Claims**



1. A side wall assembly particularly for freight cars having an undercarriage and a top roof, comprising upper and lower vertically spaced substantially parallel longitudinal members, at least one corner post connected between said upper and lower longitudinal members adjacent at least one end thereof, pivot means defining pivots on each of said upper and lower longitudinal members having axes substantially perpendicular to the longitudinal axis of the car and located intermediate the length of the respective upper and lower longitudinal members, and a middle post connected between said upper and lower longitudinal members on said pivot means for pivotal motion about the horizontal axes of said pivots perpendicular to the longitudinal axis of the car.

3,851,599

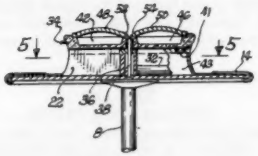
TABLE FOR USE WITH DISPOSABLE MEAL SERVICE ELEMENTS

John A. Bridges, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.

Filed Feb. 9, 1973, Ser. No. 331,023

Int. Cl. A47b *85/00*

U.S. Cl. 108—25 **8 Claims**



1. A table comprising a flat top having an upper surface and a lower surface, table supporting means extending from said table top, said upper surface having a plurality of recesses spaced one from the other around its periphery for receiving food holding plates therein, a storage section extending upwardly from said upper surface, a food holder mounted above said storage section and rotatable thereon having at least one compartment formed therein, said one compartment being of a depth sufficient to receive a food holding bowl and having portions providing thermal insulations around the sides and bottom thereof.

3,851,600

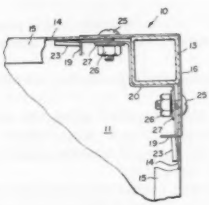
SHELF CORNER CLAMP

Carl O. Kohl, Hammondsport, N.Y., assignor to Mercury Aircraft, Inc., Hammondsport, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,099

Int. Cl. A47b *9/00*

U.S. Cl. 108—144 **10 Claims**



1. A shelf corner clamp for securing a shelf adjustably to an upright support leg, said shelf having a downward extending flange and said leg being fitted into a notch in said corner of said shelf and said flange and extending above and below said shelf, said shelf corner clamp comprising:

a. said flange having a bolt hole and a tab receiving slot on each side of said corner notch, said tab receiving slots being further from said corner notch then said bolt holes;

b. an outer bracket shaped to wrap around the outside of

said leg when said leg is in said corner notch and to extend over the outside of said flange beyond said flange bolt holes and to said tab receiving slots;

c. said outer bracket having bolt holes registered with said flange bolt holes;

d. said outer bracket having tabs extending inward through said tab receiving slots in said flange;

e. an inner bracket shaped to fit over a portion of the inside of said leg when said leg is in said corner notch and to extend along the inside of said flange beyond said flange bolt holes and beyond said tab receiving slots;

f. said inner bracket having bolt holes registered with said flange bolt holes and said outer bracket bolt holes;

g. said inner bracket having tab receiving slots registered with said tab receiving slots in said flange;

h. said tabs of said outer bracket extending through said tab receiving slots of said inner bracket;

i. a pair of bolts extending through said bolt holes in said outer bracket, said flange, and said inner bracket for drawing said outer bracket and said inner bracket toward respective outer and inner sides of said flange; and

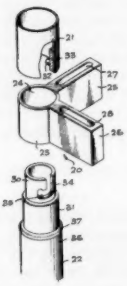
j. said inner bracket being shaped to have a clearance from said inside of said flange in the region of each of said bolts so that tightening said bolts draws said inner and outer brackets, and said leg and said shelf securely together.

3,851,601

DISPLAY CASE STAND

Jack E. Davis, 8125 Hollywood Way, Sun Valley, Calif. 91352

Filed Feb. 9, 1973, Ser. No. 331,321
Int. Cl. A47b *3/06*
U.S. Cl. 108—153 **6 Claims**



1. In a modular display stand having a plurality of individual, readily assembled components, the combination comprising:

a shelf panel for supporting a variety of items intended to be displayed;

a plurality of posts disposed along the perimeter of said panel in fixed spaced apart relationship;

each of said posts having at least two extensions arranged in end-to-end relationship;

snap-lock fastening means releasably joining the opposing ends of said extensions so as to rigidize and stabilize said post;

said snap-lock fastening means including a corner joint captured between said extensions and having a pair of laterally outward projecting members disposed at a 90° angle to each other;

side rails detachably connected at their opposite ends to respective ones of said laterally projecting members and extending between said posts; and

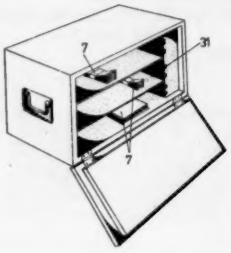
means carried on each of said side rails for supporting an adjacent edge marginal region of said panel.

3,851,602

SAFETY BOX OR THE LIKE

Wolfram Lamping, Munich/Waakirchen, Germany, assignor to G.A.O. Gesellschaft fur Automation und Organisation mbH, Munich, Germany

Filed Feb. 24, 1972, Ser. No. 228,867
Claims priority, application Austria, Feb. 23, 1971, 1522/71
Int. Cl. E05g *3/00*
U.S. Cl. 109—23 **13 Claims**



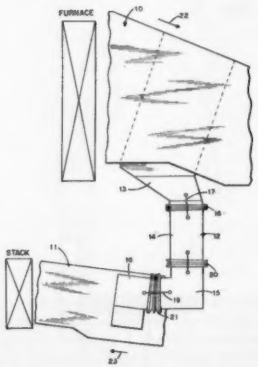
1. In a portable safety box for transporting valuables, of the type including intrusion-resistant closure walls having incorporated therewith externally invisible electric conductor supervisory loops, connected in a closed circuit with a source of potential and an intrusion responsive device, operable, when a conductor is interrupted, to activate the intrusion responsive device, the improvement comprising, in combination, plural irregularly and randomly arranged conductor loops incorporated with each wall of said box and arranged closely adjacent each other, and each forming a closed circuit with a source of potential and said device; whereby said device is activated responsive to interruption of any one of said loops; and means operatively associated with said device and operable, responsive to activation of said device, to at least substantially modify the contents of said safety box in a lasting manner.

3,851,603

INDUSTRIAL TECHNIQUE

Russell A. Stanley, Uniontown, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Continuation of Ser. No. 212,393, Dec. 27, 1971, abandoned.
This application May 29, 1973, Ser. No. 364,448
Int. Cl. F23l *9/00*; F16l *51/02*
U.S. Cl. 110—56 **1 Claim**



1. A duct structure for a boiler having an exhaust stack consisting essentially of a furnace for said boiler, a flue for

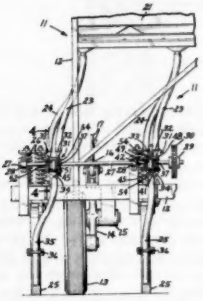
establishing communication with the exhaust in the stack, another flue relatively movable with respect to said exhaust flue for carrying air into the boiler furnace, said two flues movable relative to each other, said flues each having a respective aperture in the surface thereof for fluid communication therebetween to carry said exhaust gas into said furnace through said air flue, said exhaust being at a higher temperature than said air, a first duct segment in lateral communication with said air flue by way of said air flue aperture, an intermediate duct segment in communication with said first duct segment, an expansion joint interposed between said first and said intermediate duct segments to establish fluid communication therebetween, pin means coupling said segments together to prevent said joint from expanding in an axial direction, another duct segment in fluid communication with said intermediate duct segment, an intermediate expansion joint interposed between said intermediate and said another duct segment to establish fluid communication therebetween, pin means coupling said intermediate and said another duct segment together to prevent said intermediate joint from expanding in an axial direction, a terminal expansion joint laterally coupling said another duct segment to said stack exhaust flue by way of said flue aperture to establish lateral exhaust gas flow into the boiler furnace air flue, and pin means coupling said stack exhaust flue to said another duct segment to prevent said joint from expanding in an axial direction.

3,851,604

DEVICE FOR METERING GRANULAR MATERIAL

Edwin A. Seifert, Jr., Rt. 1, Belgrade, Mont. 59714

Filed May 18, 1971, Ser. No. 144,436
Int. Cl. A01c *5/00*
U.S. Cl. 111—77 **20 Claims**



1. Apparatus for delivering a metered mixture of two types of granular material, comprising:

a. a rotatable shaft;

b. a generally cylindrical delivery member of predetermined length mounted for rotation on the shaft, the surface of the cylindrical member having formed therein a plurality of pockets for receiving and carrying granular material;

c. a stationary cylindrical sleeve member encircling the delivery member and sized to define an annular gap therebetween, the sleeve member having first and second inlets of predetermined size and shape and first and second outlets;

d. the inlet and outlet openings being circumferentially aligned in pairs to determine a path of predetermined axial width for each type of granular material;

d. a band member for each inlet-outlet pair, the band member being disposed in said annular gap and axially slidable on the delivery member to vary the associated axial path width and thereby vary the quantity of granular material delivered from the inlet to the outlet;

e. a plate member sealably engaging each end of the sleeve member;

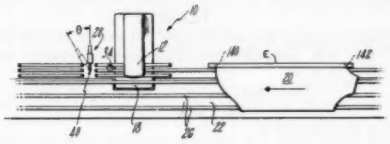
f. and an inlet conduit secured to each plate member in communication with the associated inlet and terminating in a mouth conforming to said associated inlet to permit the delivery of granular material therethrough.

3,851,605

SEWING MACHINE CUTTING MECHANISM

John L. Rockerath, Utica, N.Y., assignor to Jetsew, Inc., Barnevald, N.Y.

Division of Ser. No. 260,163, June 6, 1972, Pat. No. 3,760,748, which is a continuation-in-part of Ser. No. 153,664, June 16, 1971, Pat. No. 3,763,800. This application July 30, 1973, Ser. No. 383,991
Int. Cl. D05b *37/04*
U.S. Cl. 112—130 **7 Claims**



1. In a sewing machine having a cutting station in a feed path of material to be sewed, a cutting mechanism comprising a frame including a knife carrier mounted thereon for reciprocating movement laterally toward and away from the feed path respectively between a normal extended position and a retracted inoperative position, a knife support having a vertical pivot shaft rotatably supported on the carrier, a scissors-type knife including a movable blade operatively mounted on the knife support for movement about a generally horizontal pivot axis and a fixed blade secured to the knife support, the fixed and movable blades being supported for swinging movement with the knife support about its vertical pivot shaft for varying the angle of the knife relative to the material for a cutting operation, and knife positioning means for angularly rotating the knife support about its vertical pivot shaft and positioning it in a selected angular position to the feed path of the material for a cutting operation, the fixed blade of the knife being of sufficient length that the fixed blade remains in lapping relation to the feed path of the material throughout the operating cycle of the knife carrier during its reciprocating movement between said normal extended and retracted inoperative positions.

3,851,606

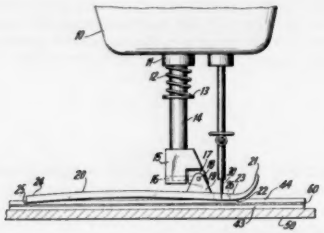
SEWING PRESSER FOOT

Wesley P. Farney, R.D.1, Soule Rd., Holland Patent, N.Y. 13354

Filed Feb. 27, 1974, Ser. No. 446,233
Int. Cl. D05b *29/00*
U.S. Cl. 112—235 **7 Claims**

1. A presser foot for a sewing machine which has toe and heel portions, which is at least slightly concave along its length, has a contact area on its bottom across its width at the beginning of the toe portion and a contact area on its bottom

across its width at the end of the heel portion, has means on its bottom to guide one or more belts used to convey fabric to



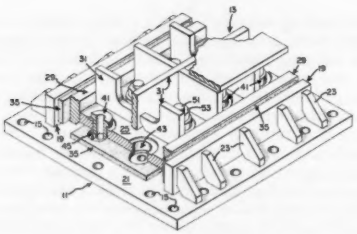
be sewn and has a cut-out portion in the toe portion to allow passage of a sewing needle through the foot.

3,851,607

REGENERATOR SUPPORT SYSTEM FOR MARINE GAS TURBINE

John L. August, Jr., and Richard T. Cuscino, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 29, 1973, Ser. No. 345,846
Int. Cl. B63b *35/00*
U.S. Cl. 114—.5 R **1 Claim**



1. A system for attaching a marine turbine powerplant regenerator having longitudinal and transverse axes to a ship's hull, said system comprising:

at least three support platforms, each support platform including a fixed plate having a substantially flat upper surface and a pair of spaced rails extending from said upper surface, said rails having elongated inner parallel surfaces which extend at right angles from said plate upper surface so as to form an elongated, generally U-shaped channel, at least two of said platforms being fixedly secured to the hull of said ship with said platform inner rail surfaces extending along one of said regenerator axes and at least one of said platforms being fixedly secured to the hull of said ship with said platform inner rail surfaces extending along the other of said regenerators axes;

a regenerator footing for each support platform, each regenerator footing including a slidable plate having a substantially flat bottom surface and a pair of spaced rails secured to opposed sides of said slidable plate, said footing rails having outwardly facing elongated parallel surfaces extending at right angles to said footing plate bottom surface, each said footing fixedly secured to said regenerator so as to extend into the U-shaped channel of its respective support platform and sized so that said footing parallel surfaces are in close sliding relationship to said platform rail surfaces;

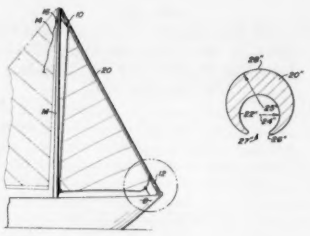
each said footing plate formed with a plurality of apertures extending therethrough, a bushing for each said aperture, each said bushing having a stem portion and a flange portion at one end of said stem portion, the stem portion of each bushing extending through said footing plate and secured to said support plate, said stem and flange portions sized so that the flange extends beyond said aperture in close spaced relationship to the upper surface of said slidable plate, each said aperture being elongated along the axis of its respective parallel rail surfaces so as to permit relative movement along such axis between each support platform and its respective footing.

3,851,608

STREAM-STAY

Leathem S. Stearn, 301 Riverdale Dr., Apt. 2, Rocky River, Ohio 44116

Filed Aug. 21, 1972, Ser. No. 282,414
Int. Cl. B63h *9/04*
U.S. Cl. 114—105 **1 Claim**



1. A torsion-resistant forestay for a jib sail, for receiving and retaining the bead on the luff of a sail to support the sail in a set position comprising a member of substantially uniform cross-section substantially throughout the length of the member, the outer surface of said member being of cylindrical configuration, said member having sail retaining means therein comprising a groove extending substantially the length thereof for receiving the bead on the luff of a sail to support the sail in set position, said groove being of cylindrical configuration and having an axis offset from the centerline of the stay and intersecting the outer surface of the member to define a slot through which the bead of the sail passes, the curvature of said outer surface and of said groove being such that the wall thickness of said member progressively increases from said slot proceeding around said groove to provide a wall thickness behind said slot which is at least twice the wall thickness adjacent said slot to provide torsional rigidity in the forestay, said member as defined being an aluminum extrusion.

3,851,609

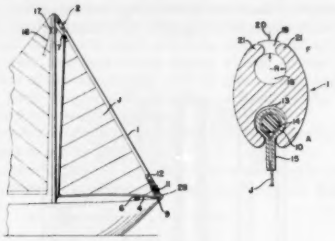
TWO GROOVE HEADSTAY

Leathem Smith Stearn, 1106 Pennsylvania Ave., Sturgeon Bay, Wis. 54235

Continuation-in-part of Ser. No. 282,414, Aug. 21, 1972,. This application Aug. 3, 1973, Ser. No. 385,443
Int. Cl. B63h *9/04*
U.S. Cl. 114—105 **19 Claims**

1. A jibstay assembly for a sailboat comprising a longitudinal member extending and supported between the bow portion of the boat and the upper portion of the boat mast, said

member being generally rounded in cross-sectional shape and having two grooves inset therein, each of which is adapted to



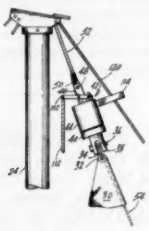
slidably receive and release and to hold a bead at the luff of a jib sail.

3,851,610

DEVICE FOR SELECTIVELY PREVENTING ROTATION OF THE UPPER END OF A REEFED SAIL AND PARTICULARLY A HEAD SAIL SUCH AS A JIB

Leonard N. Greene, Chappaqua, N.Y., assignor to Safe Flight Instrument Corp., White Plains, N.Y.

Filed Oct. 10, 1973, Ser. No. 405,071
Int. Cl. B63h *9/10*
U.S. Cl. 114—106 **14 Claims**



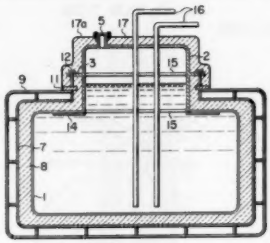
1. In combination in a sailboat having a mast and a hull
a. a headsail;
b. a luff wire running from the mast forwardly and downwardly to the hull and secured to the forward edge of the headsail;
c. means rotatably connecting the lower end of the luff wire to the hull;
d. means for rotating the lower end of the luff wire so as to furl, unfurl or reef the headsail;
e. a halyard running forwardly and downwardly from the mast; and
f. a clutch-and-swivel, said clutch having
i. a proximal element connected to the upper end of the luff wire,
ii. a distal element connected to the lower end of the halyard,
iii. means attaching the elements to each other for rotation about an axis substantially coincident with the luff wire and the halyard,
iv. means releasably locking the elements to each other,
v. means biasing the locking means into a locked mode
vi. selectively operable means for nullifying the biasing means so as to permit relative rotation of said elements in an unlocked mode, and
vii. cageing means for fixing said elements to a nearby stationary reference point when the elements are in a locked mode.

3,851,611

TANK OF A LOW TEMPERATURE LIQUEFIED GAS TANKER SHIP

Katsuro Yamamoto, Tokyo, Japan, assignor to Bridgestone Liquefied Gas Company, Ltd., Tokyo, Japan

Filed Apr. 18, 1973, Ser. No. 352,312
Claims priority, application Japan, Apr. 21, 1972, 47-40093
Int. Cl. B63b *25/16*
U.S. Cl. 114—74 A **10 Claims**



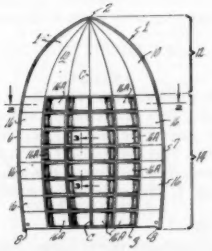
1. A low temperature liquefied gas tank for use in conjunction with a tanker ship which comprises a lower tank portion formed of a membranous member and provided at the inside of a rigid hull with the interposition of a compression resistant heat-insulating layer disposed therebetween and an upper tank portion formed of a rigid structure and connected in a fluid tight manner to the upper central portion of said lower tank portion, said upper tank portion extending through and protruding above an opening provided in a deck, said upper tank portion having an internal space large enough to provide a safe buffer space even when the liquefied gases have been loaded to a level extending substantially into said upper tank portion, and means for enabling said upper tank portion to be flexibly carried by the deck so as to be expandable in the horizontal direction.

3,851,612

SPINNAKER CONSTRUCTION

Domina C. Jalbert, 170 N.W. 20th St., Boca Raton, Fla. 33432

Filed Oct. 20, 1972, Ser. No. 299,425
Int. Cl. B63h *9/06*
U.S. Cl. 114—103 **8 Claims**



1. An improved spinnaker comprising two main portions, an upper portion aand a lower portion, said upper portion being formed of compound curvature with a lower edge, said lower portion extending from the lower edge of the upper portion to a foot, said lower portion having a center line, said lower portion being formed of a plurality of rectangular panels on each side of said center line, at least some of said panels on each side comprising aerodynamic cells, each aerodynamic cell being formed as a closed built-in pocket, each built-in

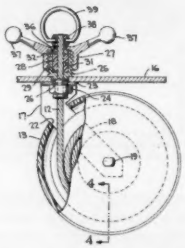
pocket having a maximum depth nearer one end of the pocket, said maximum depth extending for a substantial distance across the pocket, the maximum depth of each pocket being positioned away from the center line.

3,851,613

TIE LINE CLAMP ASSEMBLY

Philip D. Armour, Tupelo, Miss., assignor to Ingenious Devices, Inc., Tupelo, Miss.

Filed May 29, 1973, Ser. No. 364,482
Int. Cl. B63b *21/08*
U.S. Cl. 114—230 **3 Claims**



1. Clamp assembly for a boat tie line comprising: a rotatable reel mounted to a support surface of the boat; an elongated tie line wound about said reel; means for clamping said tie line comprising a hollow bolt secured to said support surface, a hollow nut in threaded engagement with said bolt, said bolt having an opening through which said tie line extends, said bolt opening including an enlarged coaxial recess having bottom and side walls, a resilient, elastomeric annular gasket disposed within said recess in contact with said walls and surrounding said tie line, an inwardly directed flange on said nut overlying said gasket and defining a coaxial opening through which said tie line extends, a bushing partially disposed within said recess and being in engagement with said flange, said bushing having a planar surface perpendicular to the axis of said tie line as it extends therethrough, said surface being in contact with the upper end of said gasket; and a bead element mounted on the free end of said tie line for maintaining said free end outwardly of said nut as said bead element rests against said flange, said gasket being compressed and its annular opening being constricted against the surrounded tie line to clamp it in place as said bushing is pressed against said gasket for compressing same upon a tightening of said nut.

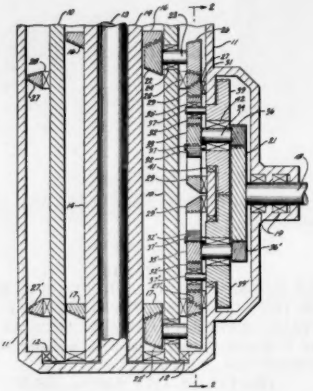
3,851,614

BALANCED STEERABLE POWER TRANSMISSION

Donald F. Nelson, 7560 Kentwood Ct., Gilroy, Calif. 95020

Continuation-in-part of Ser. No. 241,361, April 5, 1972, Pat. No. 3,750,616. This application Oct. 5, 1972, Ser. No. 295,279The portion of the term of this patent subsequent to Aug. 7, 1990, has been disclaimed.
Int. Cl. B63h *25/42*
U.S. Cl. 115—35 **15 Claims**

1. A balanced steerable power transmission comprising:
a fixed housing;
a rotatable drive member within the fixed housing;
a steerable housing around a portion of the fixed housing and mounted for pivoting about an axis extending along the fixed housing;
an output shaft fixed in location on the steerable housing and rotatable relative thereto;
a pair of similar drive trains between the drive member and the output shaft, each drive train having:
an input portion coupled to the drive member and fixed in location by the fixed housing,
an output portion in equal driving engagement with the output shaft irrespective of the pivotal location of the output shaft around the pivot axis of the steerable housing, including a ring gear between the fixed housing and the steerable housing, and means for mounting each respective ring gear for rotation about the pivot



axis of the steerable housing, said ring gears of the respective drive trains being coupled to the drive member for rotation in mutually opposite sense, and
coupling means between the drive member and the output shaft for advancement of rotation of the output portion of the drive train relative to rotation of the respective input portion.

3,851,615

ROAD MARKER

C. Grundvig, and B. Thorvaldsen, both of Fredrikstad, Norway, assignors to Moller Coates A/S and Presisjon Mek. Verksted A/S, both of Oslo, Norway

Filed July 13, 1973, Ser. No. 379,086
Int. Cl. E01f *9/10*
U.S. Cl. 116—63 R **12 Claims**

1. A road marker comprising:
a. an upper portion comprising at least two member sections which are telescopically movable with respect to each other;
b. means for fixedly positioning each telescopic section with respect to each adjacent telescopic section;
c. a lower portion comprising an elongated member of sufficient strength to be driven into the ground;

d. a ball joint joining said upper and lower portions, said ball joint comprising two spherically shaped members, one of which is spherically shaped on its interior and the other of which is spherically shaped on its exterior, said members being separable but being adapted to be coupled together in cooperative relationship for axial movement of said upper and lower portions, one of said spherical ball joint members being rigidly affixed to the upper portion of the road marker and the other of said spherical ball joint members being rigidly affixed to the lower portion of said road marker;

e. means for fixedly positioning the ball joint members with respect to each other; and

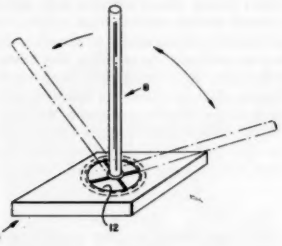
f. a member affixed to the other end of said upper portion from the ball joint end, said member being the marker.

3,851,616

PORTABLE TRAFFIC MARKER

Woodrow I. Brown, 4140 Thompson Dr., Concord, Calif. 94518

Filed Sept. 4, 1973, Ser. No. 394,402
Int. Cl. E01f *9/10*
U.S. Cl. 116—63 R **5 Claims**



1. A portable traffic marker including a relatively flat ground-engaging base member having a central opening extending vertically therein, a separate vertical standard disposed centrally of said central opening and extending upwardly therefrom, a plate-like member secured to said standard adjacent the lower end thereof, a plurality of resiliently extensible means connected to and extending under tension from the periphery of the central opening of said base member to the lower end of said standard to support said standard above the ground, whereby said standard may be deflected by a moving object from said vertical position to an inclined position relative to said base member and restored to said vertical position.

3,851,617

PIPE CLEANING AND PRIMING APPARATUS

Martin A. Usab, Santa Ana, Calif., assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Sept. 10, 1973, Ser. No. 396,084
Int. Cl. B05c *11/00*
U.S. Cl. 118—3 **18 Claims**

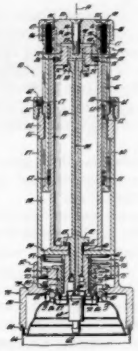
1. Apparatus for cleaning and/or priming the outside and inside surfaces of a pipe and fitting or other hollow cylindrical object comprising:

a first elongate, cylindrical body section being insertable into the open end of said fitting;

first annular pad means surrounding said first body section, at the one end thereof insertable into said fitting, said first pad means extending outwardly from said first body section so as to contact the inside surface of said fitting;

a second elongate, hollow, cylindrical body section positioned coaxially with and surrounding said first body section and connected thereto for slidable movement in a direction parallel to the axes thereof, said second body section defining an open-ended chamber at one end thereof for receipt of the end of said pipe; and

second annular pad means positioned within said chamber in said second body section and connected thereto adjacent said one end thereof, said second pad means extending inwardly from said second body section so as to contact the outside surface of said pipe, said second body section being positionable, relative to said first body section,



in a first position with said first and second pad means in contact,

in a second position with said second pad means surrounding said first body section, out of contact with said first pad means, permitting insertion of said first body section into said open end of said fitting, and

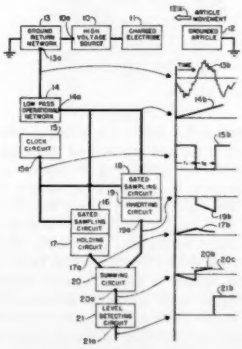
in a third position with said first pad means within said chamber, out of contact with said second pad means, permitting insertion of said pipe into said chamber.

3,851,618

ELECTROSTATIC COATING APPARATUS

Stanley L. Bentley, assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Jan. 14, 1974, Ser. No. 433,265
Int. Cl. B05b *5/02*
U.S. Cl. 118—7 **4 Claims**



1. In an electrostatic coating system including

a high voltage supply having two terminals;

a conveyor for transporting articles to be coated;

an electrostatic coating device connected with the one

terminal of the high voltage supply to create electrostatic deposition of atomized coating material;

and means connected between the other terminal of the high voltage supply and ground to sense the electric current between the high voltage supply and ground, and to disconnect the high voltage supply from its energizing source, the improvement in which the means connected between the above terminal and ground includes

a low pass type operational network to provide a signal with attenuation of all electrical current components significantly above direct current, while amplifying direct currents;

a clock to generate a sampling gate for the signal;

two gated sampling circuits to detect the direct current level of the signal when gated by the clock, one of the gated sampling circuits being connected to a holding circuit for the detected signal for one cycle of the gating signal, and the other gated sampling circuit being connected to an inverting circuit to invert the signal from the other gated sampling circuit;

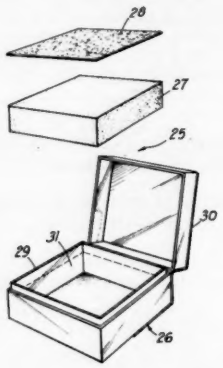
a summer to determine the difference of the signal from the holding circuit and the inverted signal from the other gated sampling circuit; and

a level detector to generate an operative signal in the event the level exceeds a predetermined level which represents incipient grounding of the high voltage electrode.

3,851,619
FINGERPRINT APPARATUS

Eugene P. Cofield, Jr., Atlanta, Ga., and Richard G. Rowe, Woodstock, N.Y., assignors to Scripto, Inc., Atlanta, Ga.

Filed June 14, 1972, Ser. No. 262,773
Int. Cl. A61b *5/10*
U.S. Cl. 118—31.5 **6 Claims**

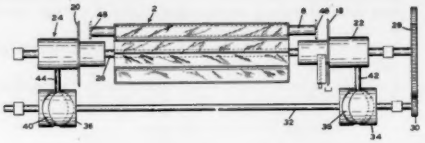


1. An apparatus for coating a predetermined amount of developer upon a surface portion of the human body upon contact therewith, for producing an inkless print when said coated body portion is applied to a reagent coated surface, comprising a developer storing means which includes an element formed of a rigid material and having a substantially smooth face, and a membrane permeable to said developer, mounted adjacent to and overlying said face, said membrane and face being spaced a short distance apart to provide a uniform interfacial void which is sufficiently restricted to cause the developer to be attracted into said void, said developer being withdrawn through said membrane when said body portion is pressed upon said membrane, and transferred to the surface of said body portion, said withdrawn developer being replaced by developer attracted into said void from said storage means; and said membrane being of sufficient thinness to prevent it from acting as a storage reservoir.

3,851,620
TUBE END COATER

William A. Greiner, Jr., Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 22, 1972, Ser. No. 317,665
Int. Cl. B05c *1/02*
U.S. Cl. 118—50 **2 Claims**

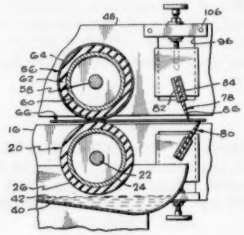


1. An adhesive-coating apparatus composed of a turret structure having a tube receiving means and a vacuum retaining means which will fixedly hold a tube in position within the turret structure, said turret structure being rotated through approximately a 90° arc path of movement, at which time adhesive will coat the ends of the tube, adhesive disks being positioned adjacent each end of the tube within the turret, said adhesive disks having planar surfaces with adhesive thereon, each said planar surface moving from a plane containing one end of the tube to a plane parallel to the plane containing one end of the tube, normally the adhesive disk being spaced from the end of the tube, appropriate drive means being connected to the adhesive disks to cause the adhesive disks to sequentially move into the planes containing the ends of the tube whereby the adhesive disks will apply adhesive first to one end of the tube and then to the other end of the tube when the plane of each adhesive disk is in a plane of the end of the tube.

3,851,621
APPARATUS FOR ETCH RESIST COATING OF PLATED HOLES IN PRINTED CIRCUIT BOARDS

David Shepard, 2525 Washington Blvd., Los Angeles, Calif. 90018

Division of Ser. No. 224,805, Feb. 9, 1972, Pat. No. 3,776,771.
This application Nov. 23, 1973, Ser. No. 418,593
Int. Cl. B05c *11/04*
U.S. Cl. 118—102 **6 Claims**



1. An apparatus for coating the interior of holes in printed circuit boards comprising:

means for applying a liquid coating solution to a printed circuit board having a top and bottom and a hole therebetween;

means for engaging the coated printed circuit board on both the top and bottom thereof for propelling the printed circuit board along a generally horizontal reference plane and for squeezing the liquid coating solution into the hole in the printed circuit board;

means for squeegeeing the top of the printed circuit board as it is propelled by said means for engaging and propel-

ling said printed circuit board and means for squeegeeing the bottom of the printed circuit board as it is propelled along the reference plane, said means for squeegeeing the bottom being positioned after said means for squeegeeing the top in the direction of movement of the printed circuit board along said reference plane; and

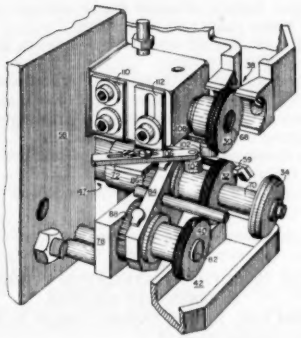
each said means for squeegeeing comprising a resilient squeegee blade mounted on a pivot shaft disposed normal to the path of board movement whereby to angularly adjust blade to board relationship, and said shaft being mounted in vertically slidable bearing blade means whereby the blade is adjustable in direction toward and away from the board.

3,851,622

MACHINE FOR APPLYING CEMENT TO SHOE COMPONENTS OR THE LIKE

Sumner Boynton, Beverly, Mass., assignor to Boston Machine Works Co., Lynn, Mass.

Filed May 24, 1973, Ser. No. 363,516
Int. Cl. B05c *1/00*
U.S. Cl. 118—228 **10 Claims**



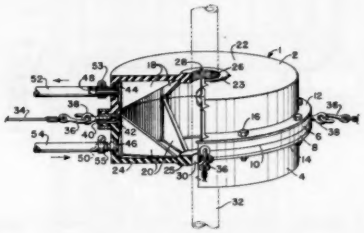
1. An apparatus for applying cement to margins at opposite faces of a shoe component of differeing thickness, said apparatus comprises a base, an electric motor fixed with respect to said base, a first journal fixed with respect to said base, a first shaft in said first journal and driven by said electric motor, a second journal constrained for motion with respect to said base in a first direction, a second shaft mounted for rotation in said second journal, a universal coupling connecting said electric motor and said second shaft, a first cement wheel keyed to said first shaft, a second cement wheel keyed to said second shaft, a third journal constrained for motion with respect to said base in a second direction, a third shaft in said third journal, a third cement wheel keyed to said third shaft, a link fixedly connecting said second journal and said third journal, resilient means connected between said base and said link in order to urge said second cement wheel toward said first cement wheel, a first cement supply communicating with said first cement wheel, a second cement supply communicating with said third cement wheel, said second cement wheel and said third cement wheel being geared together and in contact so that cement is transferred from said third cement wheel to said second cement wheel, whereby as said second wheel moves toward and away from said first cement wheel, the exposure of said third cement wheel to said second cement supply is maintained constant.

3,851,623

METHOD OF AND DEVICE FOR COATING LENGTHS OF LINEAR ELEMENTS

Floyd J. Landry, Jr., 1207 W. Ohio St., Midland, Tex. 79701

Division of Ser. No. 212,989, Dec. 28, 1971, abandoned. This application Sept. 20, 1973, Ser. No. 399,054
Int. Cl. B05c *3/02*
U.S. Cl. 118—405 **14 Claims**



1. A device for coating a linear element, which device comprises;

a. a housing forming a chamber,

b. an elastomer member fitted in each end of said housing,

1. each said elastomer end member having an aperture formed therein, which apertures are in axial alignment,

2. a conduit connected in fluid communication with said housing near each end thereof,

c. pump means connected in fluid communication with said conduits to circulate a coating of liquid into and out of said housing, and

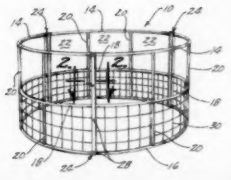
d. the linear element adapted to be passed through said apertures in said elastomer end members to receive a coating of liquid thereon.

3,851,624

PORTABLE ANIMAL FEED BUNK AND METHOD OF FEEDING STACKED OR BALED HAY

Leonard R. Peak, Lacona, Iowa 50139

Filed Oct. 9, 1973, Ser. No. 404,673
Int. Cl. A01k *05/00*
U.S. Cl. 119—60 **5 Claims**



1. A portable animal feed bunk comprising,

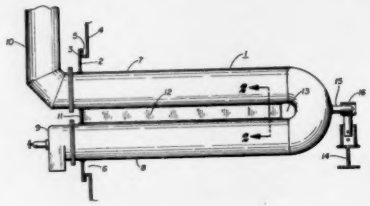
a plurality of arcuate frame sections having interconnected overlapping end portions forming a cylindrical feed bunk of substantially large diameter, open at opposite ends and along its length for free formed substantially large baled hay, said frame sections having a grid formed by vertical and horizontal members in spaced apart relationship with the substantial top half of said grid having large animal feeding grid openings and the substantial bottom half of said grid having hay retaining relatively smaller grid openings, and said feed bunk being light weight for rolling between use locations and tipping onto said large bales of hay.

3,851,625

LIQUID HEATER

Fletcher O. Holt, Tulsa, Okla., assignor to Combustion Engineering, Inc., New York, N.Y.

Filed Oct. 11, 1973, Ser. No. 405,355
Int. Cl. F22b 7/00
U.S. Cl. 122—136 R 3 Claims



1. A firetube of U-shape extended horizontally, including, a tube sheet through which the ends of the legs of the U-shaped tube are mounted and to which the legs are welded, and

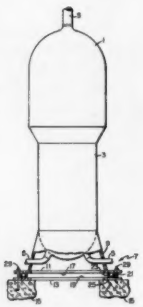
a flat plate extended between the parallel legs of the tube for a substantial length of the space between the legs and attached to the walls of the legs by welding along the length of the plate.

3,851,626

SUPPORT FOR A STEAM GENERATOR

John Boyd, and Allan K. Hennel, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 5, 1972, Ser. No. 295,336
Int. Cl. F22b 37/24
U.S. Cl. 122—510 7 Claims



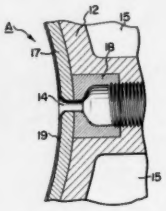
1. A support for a heat exchanger having fluid conduits connected thereto, said support comprising a first generally horizontal planar surface, a second generally planar surface disposed generally parallel to and adjacent said first planar surface, said first planar surface being fastened to said heat exchanger, a base upon which said second planar surface rests, fastening means connecting said first planar surface to said base so as to allow parallel relative movement between said base and said first planar surface, a first ring, a second ring generally smaller than said first ring, said rings being disposed between said planar surfaces and being free to move with respect to at least one of said planar surfaces, and a plurality of spherical shaped members disposed between said rings and said planar surfaces, whereby any point on said heat exchanger is free to move in any direction in a plane parallel to said planar surfaces as said conduit expands and contracts due to thermal variations, thus minimizing the stresses on the heat exchanger associated with such thermal variation.

3,851,627

ROTOR HOUSING STRUCTURE FOR ROTARY PISTON ENGINE

Yasuto Terazawa, Hiroshima-ken, Japan, assignor to Toyo Kogyo Co. Ltd., Hiroshima-ken, Japan

Filed May 15, 1973, Ser. No. 360,531
Claims priority, application Japan, May 16, 1972, 47-57045
Int. Cl. F02b 53/00
U.S. Cl. 123—8.09 5 Claims



1. A rotor housing structure for an internal combustion engine of rotary piston type comprising:

an iron sheet of trochoidal shape and having an inwardly diverging hole;

an adapter formed with an inwardly reduced shooting hole and welded to the outside of said iron sheet with the outermost end of said diverging hole registering with the innermost end of said shooting hole;

a rotor housing substrate cast around said iron sheet and said adapter; and

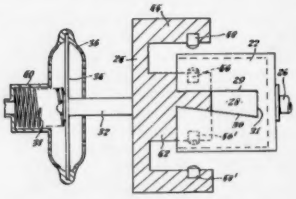
an electroplated layer covering the inside wall of said iron sheet.

3,851,628

FUEL INJECTION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Eric Harold Ford, London, England, assignor to Lumenition Limited, London, England

Filed Nov. 6, 1969, Ser. No. 874,470
Claims priority, application Great Britain, Nov. 12, 1968, 53580/68
Int. Cl. F02m 51/00
U.S. Cl. 123—32 EA 8 Claims



1. A device for fast switching the solenoid of a fuel injector system of an internal combustion engine, including a photo-transistor sensitive to infra-red radiation which will switch on or conduct when exposed to the radiation and switch off when the radiation is cut off; a gallium arsenide lamp emitting infra-red radiation; an element which is opaque to infra-red radiation positioned between the gallium arsenide lamp and the photo-transistor, said opaque element having at least one aperture therein; means for moving the opaque element in

timed relation to the engine revolutions; an amplifier having first and second transistors connected in cascade to the output of the photo-transistor and arranged to switch in inverse relation to one another so that at any one time a transistor is always conducting; and a power transistor connected to the output of the amplifier to be switched in inverse relation to the second transistor and connected in circuit relationship with the solenoid such that every time a beam of radiation falls onto and is cut off from the photo-transistor, said transistorized amplifier circuit and power transistor cause the fast switching of the solenoid to inject the desired quantity of fuel into a cylinder of the internal combustion engine in accordance with the period during which thephoto-transistor is exposed to infra-red radiation.

3,851,629
COOLING INSTALLATION FOR PISTON INTERNAL COMBUSTION ENGINES

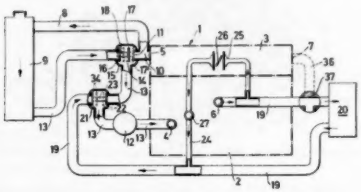
Bertold Mayr, Beutelsbach; Richard Henning, Munich, and Erwin Schweiger, Dachau, all of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Germany

Filed Feb. 9, 1973, Ser. No. 331,036

Claims priority, application Germany, Feb. 10, 1972, 2206266

Int. Cl. F01p *7/14*

U.S. Cl. 123—41.08 **41 Claims**



1. A circulatory cooling installation for piston internal combustion engines having combustion zones, the installation comprising a cooling jacket means and a control means which is operable to interrupt the cooling medium circulation through the cooling jacket means at least within the area of the combustion zones up to a predetermined first limit value, which above the first predetermined limit value is operable to limit the circulation at first to a closed circulation in bypassing relationship to a radiator and under avoidance of a fresh water exchange, and which above a further predetermined limit value is operable to include into the cooling medium circulation at least one of radiator, fresh water exchange and a heater heat-exchanger means, characterized in that the control means includes in effect a cooling medium valve means and a three-way thermostat means each having a separate control element, of which the cooling medium valve means is actuated upon reaching the first limit value and the three-way thermostat means is actuated upon reaching the further limit value.

3,851,630
ROTARY PISTON ENGINE

Merrill J. Foster, Fox River Grove, Ill., assignor to Marine Industries Incorporated, Barrington, Ill.

Filed Oct. 19, 1972, Ser. No. 299,142

Int. Cl. F22b *9/00*

U.S. Cl. 123—44 R **18 Claims**

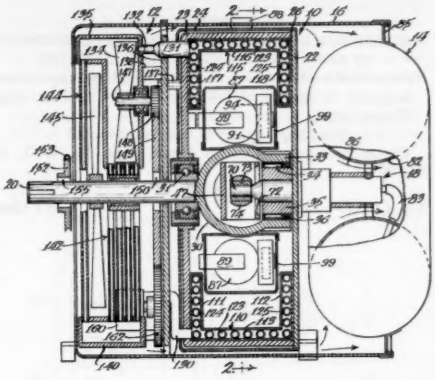
1. A rotary piston engine, comprising:

a. a frame,

b. a crankcase rotatable on the frame,

c. a pair of combustion cylinders extending in opposite directions from the crankcase transverse to the axis of rotation,

d. a piston displaceable in each cylinder including a piston rod rigidly secured to the associated piston and to the other rod,



e. an eccentric pin on the frame parallel to the axis of rotation, and

f. bearing means slidably connecting the pin to the piston rods so that action of the pistons causes rotation of the crankcase.

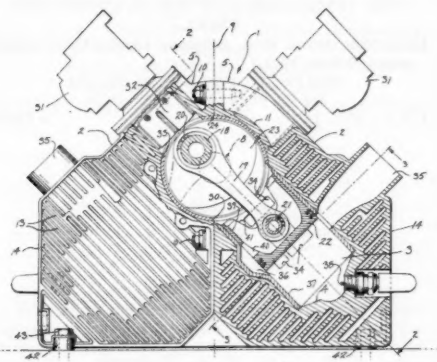
3,851,631
DIE CAST V-TYPE TWO-CYCLE ENGINE

Elmer Carl Kiekhaefer, Winter Haven, Fla., assignor to Kiekhaefer Aeromarine Motors, Inc., Fond du Lac, Wis.

Filed Mar. 16, 1973, Ser. No. 341,923

Int. Cl. F02b *25/28;* **F02f** *3/00*

U.S. Cl. 123—55 R **14 Claims**



1. A V-type two-cycle engine comprising a pair of symmetrically disposed separate engine block units, each unit providing an integral cylinder, cylinder head and a crank case half; a pair of like end closure members for the crank case, each carrying a bearing for supporting a crank shaft main journal; a crank shaft having a single crank pin carrying the connecting rods for the pistons operative in said cylinders; sleeve means lining said crank case between said end closures; rotating partition means on said crank pin and radially sealed at its periphery to said sleeve means to divide said crank case into separate compression chambers for feeding fuel-air charge to said cylinders; and means joining said engine block units on a

parting plane containing the axis of said crank shaft and bisecting a V angle of approximately 90° between the cylinders of said two units.

3,851,632

METHOD FOR CONTROLLING NOXIOUS COMPONENTS OF EXHAUST GAS FROM DIESEL ENGINE

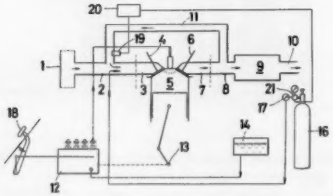
Naohisa Teshirogi, and Hiroo Nakahara, both of Tokyo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Sept. 11, 1973, Ser. No. 396,325

Claims priority, application Japan, Sept. 11, 1972, 47-91575

Int. Cl. F02m *25/06*

U.S. Cl. 123—119 A **1 Claim**



1. A method for the control of noxious components of the exhaust gas from a normally aspirated type diesel engine adapted to permit recirculation of the exhaust gas, improvement comprising having the exhaust gas constantly checked for oxygen concentration and, each time the oxygen concentration falls below a preset level, allowing additional oxygen to be supplied to said engine.

3,851,633

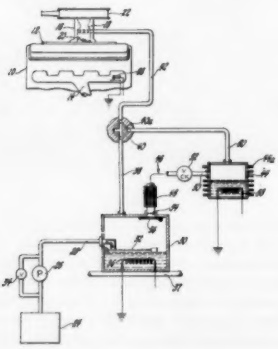
FUEL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Kelvin Shih, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1972, Ser. No. 301,652

Int. Cl. F02d *19/06;* **F02b** *43/04*

U.S. Cl. 123—127 **6 Claims**



1. A fuel supply system for an internal combuation engine having an air induction passage provided with a venturi, a fuel reservoir for liquid fuel, a first fuel vaporizing chamber having a first heat source associated therewith, pump means connected to said fuel reservoir and to said first fuel vaporizing chamber for supplying fuel from said fuel reservoir to said first fuel vaporizing chamber, a second fuel vaporizing and storage chamber for light end fuel having a second heat source associated therewith, a vapor separator and valve controlled conduit means connecting said second fuel vaporizing chamber to said first fuel vaporizing chamber whereby only the light end fuel portion of the fuel vapor generated in said first fuel vaporizing chamber flows to said second fuel vaporizing and storage chamber and, valve controlled conduit means selectively connecting said first fuel vaporizing chamber and said second fuel vaporizing chamber to said venturi.

3,851,634

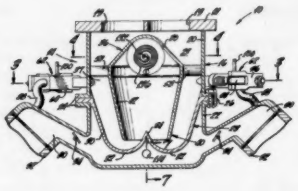
FUEL INDUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Vernon M. Everett, 13128 Vallecito Ave., Beaumont, Calif. 92223

Filed June 20, 1973, Ser. No. 371,732

Int. Cl. F02m *17/18*

U.S. Cl. 123—133 **10 Claims**



1. A fuel induction system for an internal combustion engine, including an intake manifold, a carburetor attached to said manifold, and a fuel-vaporizing device interposed between said carburetor and said manifold, said device comprising:

a housing forming an enclosed chamber that is connected at the top to said carburetor to receive the fuel-air mixture therefrom;

a diffuser mounted within said chamber and cooperating with the latter to define a passageway between the diffuser and said housing, said diffuser including an inverted horn that is open at the bottom;

means for imparting a high-velocity spin to said fuel-air mixture as the latter moves downwardly through said passageway;

a heat-exchange bowl mounted within said housing, surrounding the lower portion of said diffuser and extending under said horn at a distance therefrom, said heat-exchange bowl having a rounded bottom that directs the spinning fuel-air mixture in toward the center and up into the bottom end of said inverted horn;

means for heating said heat-exchange bowl to a temperature well above the vaporization point of the fuel;

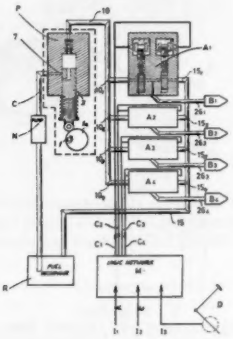
the minute droplets of liquid fuel suspended in the fuel-air mixture received from said carburetor being thrown outwardly by centrifugal force against the inner surface of said heat-exchange bowl due to the high velocity spin of the mixture, and said liquid droplets being vaporized by contact with the hot wall of the heat-exchange bowl, the vaporized fuel and air being intimately mixed by the turbulent swirling motion of the mixture as it reaches the bottom of the bowl and is turned inwardly and up into the open end of said horn; and

means for distributing the dry, gaseous fuel vapor and air mixture from said diffuser to said intake manifold.

3,851,635
ELECTRONICALLY CONTROLLED FUEL-SUPPLY SYSTEM FOR COMPRESSION-IGNITION ENGINE

Fernand R. C. Murtin; Loic Mercier, and Jean Barat, all of Paris, France

Division of Ser. No. 36,814, May 13, 1970, Pat. No. 3,742,918.
This application Sept. 5, 1972, Ser. No. 285,736
Claims priority, application France, May 14, 1969, 69.15592
Int. Cl. F02m *51/00;* **F02d** *5/04*
U.S. Cl. 123—139 E **3 Claims**



1. A system for controlling the fuel supply to a compression-ignition engine having a plurality of piston cylinders each provided with a fuel injector, comprising:

a source of fuel for said engine;

a distributing channel having a plurality of branches extending to a drain for excess fuel;

engine-controlled pump means for delivering fuel at high pressure to said channel in a succession of compression strokes;

a pair of electrically controlled valves disposed in tandem in each of said branches, said pair including a normally open first valve and a normally closed second valve;

an extension conduit leading from each branch to a respective fuel injector, said conduit communicating with the corresponding branch at a location downstream of said first valve and upstream of said second valve; and

electronic gating means for periodically opening said first valve and concurrently closing said second valve of each branch in cyclic succession during successive injection intervals for admitting fuel from said channel to the respective injectors.

3,851,636
SOLID STATE IGNITION CIRCUITRY

Franklin H. Just, 1788 Charlene St.; Brent L. Powell, General Delivery, and John A. Waters, 1845 Sequoia, all of Idaho Falls, Idaho 83401

Filed Oct. 1, 1973, Ser. No. 402,010
Int. Cl. F02p *3/06*
U.S. Cl. 123—148 E **9 Claims**

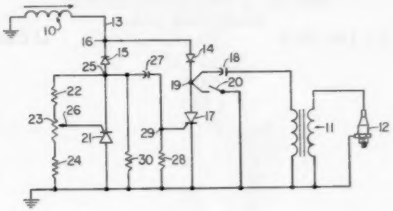
1. Circuitry for controlling the transmission of impulse voltages produced by a magneto on an internal combustion engine to a transformer which, in turn, generates a high voltage impulse to produce sparks in the spark plugs of the engine, said circuitry comprising,

an input conductor adapted to receive impulse voltages from a magneto;

a first circuit connected to said input conductor comprisin series a first diode rectifier, a first capacitor and an output conductor, the latter being adapted to be connected to the transformer;

a second circuit connected between said first circuit and ground comprising, a first silicon controlled rectifier having an anode, cathode and a control electrode, with the cathode thereof connected to ground and the anode thereof connected to said first circuit between said first rectifier diode and said first capacitor;

a third circuit comprising, a second diode rectifier and a second silicon controlled rectifier connected in series between said input conductor and ground with the cathode and anode of said second diode rectifier being connected to the input conductor and the cathode of the second silicon controlled rectifier respectively, and the

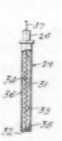


anode of said second silicon controlled rectifier being connected to ground, said second silicon controlled rectifier having a potentiometer shunting the anode and cathode thereof with the variable contact arm of said potentiometer being connected to the control electrode of said second silicon controlled rectifier, said third circuit also including a second capacitor and a resistor connected in series between the cathode of said second silicon controlled rectifier and ground, with the control electrode of said first silicon controlled rectifier being connected to said third circuit at a point therein intermediate between said second capacitor and said resistor.

3,851,637
SPARK PLUG WITH GLOW PLUG

Sam J. Green, Temperance, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Apr. 18, 1973, Ser. No. 352,115
Int. Cl. F02p *1/00;* **F02b** *53/00*
U.S. Cl. 123—169 PB **6 Claims**



1. An ignition device for an internal combustion engine comprising, in combination, a generally tubular shell having a threaded portion for attachment to the engine, an electrical insulator having a bore extending therethrough for mounting a center electrode assembly, means mounting said insulator in said shell, a ground electrode, means attaching said ground electrode to said shell adjacent said threaded portion with said ground electrode positioned to be within a combustion chamber in the engine when the device is attached to the engine, a center electrode assembly, means mounting said center electrode assembly in said insulator bore, said center electrode assembly including a tip positioned for defining a spark gap with said ground electrode for spark ignition of fuel in such engine combustion chamber, said tip having an internal chamber, electrical heating means mounted within said tip chamber for preheating such engine combustion chamber prior to starting the engine, and means connected for selectively ap-

plying electrical power to said heating means and to said tip including power control means having a high voltage terminal for connection to an ignition system for the engine, means electrically connecting said high voltage terminal to said tip, a low voltage terminal for connection to a power source, and switch means for selectively connecting said low voltage terminal to said heating means.

3,851,638

FORCE MULTIPLYING TYPE ARCHERY BOW

Alex E. Alexander, Ashland, Oreg., assignor to Kam-Act Enterprises, Inc., Ashland, Oreg.

Filed Feb. 2, 1973, Ser. No. 328,932
Int. Cl. F41b *5/00*
U.S. Cl. 124—24 R **13 Claims**

1. An archery bow comprising

an elongate bow member having a centrally disposed handle section a pair of rigid limbs extending outward from said handle section presenting a first pair of spaced ends, a pair of flexible limbs extending outward from said handle section and presenting a second pair of spaced ends, one flexible limb of said pair of flexible limbs being laterally spaced from and extending along the side of one rigid limb and the other flexible limb of said pair being laterally spaced from and extending along the side of the other of said rigid limbs,

leveraging means mounted on said bow member at each of said first pair of ends for reducing the force necessary to draw and to hold a bowstring in a fully drawn position, each of said means including first and second leveraging members,

a bowstring disposed between said first pair of ends and interconnecting said first leveraging members, and

flexible means disposed between and interconnecting each of said second pair of ends and an associated second leveraging member.

3,851,639

PORTABLE COMBINATION COOKING APPARATUS AND METHOD

Justin M. Beddoe, P.O. Box 744, Bellevue, Wash. 98004

Continuation-in-part of Ser. No. 84,819, Oct. 28, 1970, abandoned. This application Feb. 26, 1973, Ser. No. 335,803
Int. Cl. A47j *37/00;* **F24b** *3/00*
U.S. Cl. 126—25 R **17 Claims**

1. A portable combination cooking apparatus, comprising:

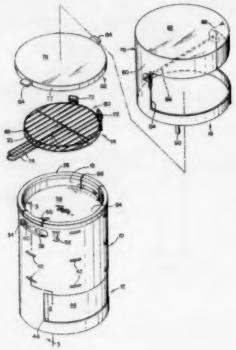
a. a housing having substantially closed bottom and side walls and an upper rim defining a substantially open top, said housing defining a burner chamber adapted to burn crumpled newspaper;

b. said housing having at least one lateral ventilating opening formed therein at a location in the top portion of the housing moderately below the upper rim of the housing, and sized to provide controlled air flow into the combustion chamber of the housing for controlled burning;

c. a grill removably mounted to the open top portion of the housing;

d. a removable perforate charcoal briquette containing basket adapted to be mounted in the housing top opening at a location below the grill;

e. a removable convertible pan-cover mounted over the top



of said housing and adapted to be used either as a closure for the housing top opening and/or as a cooking pan;

f. a removable hood assembly comprising a hood with an access opening, a door to close the opening and means to mount food within said hood, said hood being mounted above said housing; and

g. an oven base on which said housing is mounted, said oven base defining an oven chamber and wherein the bottom of said housing defines a heat conductive roof separating said oven chamber from the combustion chamber, whereby said oven is heated by heat from the burning chamber of the housing.

3,851,640

DEEP FAT FRYER WITH CONTROLLABLE HEAT-UP FOR COLD FAT MELT

Richard T. Keating, 144 N. Cuyler Ave., Oak Park, Ill. 60300, and Richard T. Keating, Jr., 234 W. 79th St., Clarendon Hills, Ill. 60514

Continuation-in-part of Ser. No. 225,165, Feb. 10, 1972, abandoned. This application Apr. 27, 1973, Ser. No. 354,946
Int. Cl. A47j *27/26*
U.S. Cl. 126—391 **5 Claims**

1. A two-stage gas supply system for deep-fat melter-fryer burners comprising:

a. a gas source;

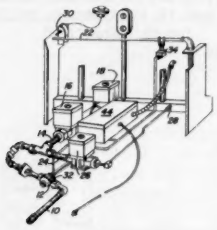
b. a single gas line having its inlet end connected in fluid communication with an outlet from the source;

c. a flow-control valve having a remote control input and having its inlet connected in fluid communication with the outlet from the gas line and its outlet in fluid communication with the inlet to the melter-fryer burners;

d. a fat fryer control means having its input operationally connected to a power supply and its output operationally connected to the remote control input of the flow-control valve for controlling the supply of gas to the burners supplying heat to the melted fat for purposes of frying;

e. a fat melter control means having its input operationally connected to the output of the fat fryer control means,

and its output operationally connected to the remote control input of the flow-control valve for controlling the supply of gas to the burners supplying heat to melt the solid fat; and



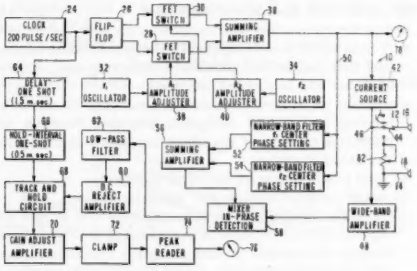
f. selection means operationally connected to both the fat fryer control means and the fat melter control means for mutually excluding the operation of each one from the other.

3,851,641

METHOD AND APPARATUS FOR DETERMINING INTERNAL IMPEDANCE OF ANIMAL BODY PART

Joseph G. Toole, 1492 Rolshead Dr., San Jose, Calif. 95125, and Wade H. Foy, 214 E. Edith Ave., Los Altos, Calif. 94022

Filed Nov. 29, 1973, Ser. No. 420,186
Int. Cl. A61b *5/05*
U.S. Cl. 128—2.1 Z **21 Claims**



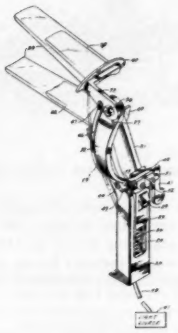
1. Apparatus for sensing a physiological and pathological change of a body part of an animal comprising: means for generating two electrical currents with each current being at a respective frequency; means coupled with said generating means for connecting the same to an animal body part to permit said currents to be directed therethrough, whereby a voltage corresponding to each current, respectively, will be developed across said body part; a device for detecting the in-phase components of a voltage signal; means coupled with said connecting means for applying each voltage across the body part to said detection device, whereby the output of the detection device is a signal representing the in-phase component of the voltage corresponding to a respective current; means coupled with said detection means for subtracting the magnitude of the in-phase signal corresponding to the current at a first frequency from the in-phase signal corresponding to the current at a second frequency to provide a difference signal; and means coupled with said subtracting means for indicating the difference signal.

3,851,642

MEDICAL EXAMINING INSTRUMENT

Bernard McDonald, Malibu, Calif., assignor to Medical Testing Systems, Inc., Beverly Hills, Calif.

Continuation-in-part of Ser. No. 192,390, Oct. 26, 1971, Pat. No. 3,762,400, which is a continuation-in-part of Ser. No. 144,468, May 18, 1971, Pat. No. 3,744,481. This application Aug. 14, 1972, Ser. No. 280,112
Int. Cl. A61b *1/06, 1/32, 1/30*
U.S. Cl. 128—18 **12 Claims**



1. A vaginal speculum comprising:
an elongated operating handle having an upper end and a lower end;
a lower blade support tang fixed on the handle;
a slide mounted for movement along the length of the handle;
releasable ratchet means for permitting upward movement of the slide and inhibiting downward movement of the slide;
an upper blade support tang, said upper and lower blade support tangs each adapted to receive and temporarily support a hollow transparent blade;
means for mounting the upper tang on the slide for pivoting about an axis transverse to the direction of movement of the slide;
lever operated means mounted on the slide for pivoting the upper tang towards and away from the lower tang;
resilient means for biasing the upper tang towards the lower tang;
means for adjusting the biasing force of the resilient means; and
means for temporarily latching the upper tang in a open position relative to the lower tang.

3,851,643

ON-OFF ARRANGEMENT FOR A LIQUID JET HAND APPLIANCE

Jean-Pierre Musy, Geneva, Switzerland, assignor to Les Produits Associes, SA, Geneva, Switzerland

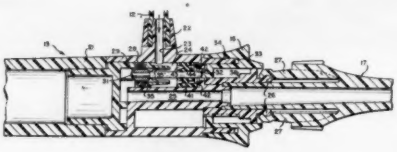
Filed Oct. 19, 1973, Ser. No. 407,848
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **8 Claims**

1. A liquid jet hand appliance for personal hygiene, for receiving liquid pressure pulses from a pump unit through a flexible tube, said hand appliance comprising
a. an elongated casing having an inlet passage for receiving said liquid pressure pulses and an outlet passage,
b. a chamber having an outlet at one end connected with said outlet passage, an opening to the atmosphere at the other end thereof, and an inlet intermediate said outlet and opening and connected with said inlet passage,
c. a bistable valve in said chamber including a sealing ring at the chamber outlet and a valve member affixed at the

end of a longitudinally movable rod passing into the chamber through said opening,

d. said valve member being of larger diameter than said rod and adapted for engaging said sealing ring in the closed position of the valve and disengaging from the sealing ring upon movement into said chamber to the open position of the valve,

e. a manual control member attached to said rod for moving



said valve member to said closed and open positions thereof,

f. and a slidable sealing member slidably mounted on said rod between said valve member and said opening and engaging the encircling wall of said chamber,

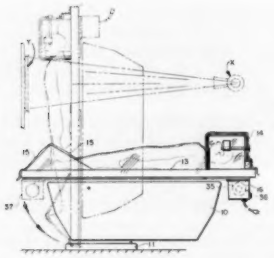
g. said slidable sealing member having an annular resilient lip engageable with said other end of the chamber around said opening.

3,851,644

METHOD AND APPARATUS FOR RAPIDLY IMMOBILIZING A PATIENT

Edward Slagle, Montgomery, Ohio, assignor to Picker Corporation, Cleveland, Ohio

Filed Jan. 12, 1973, Ser. No. 323,207
Int. Cl. A61g *13/00*
U.S. Cl. 128—134 **22 Claims**



1. A patient immobilization apparatus for immobilizing a patient, comprising:

a. a patient positioner for supporting a patient;

b. a flexible member composed of an air impervious material extending over and peripherally from at least part of said positioner to cover at least part of a patient's body including the head and defining an evacuable region substantially sealed from atmosphere surrounding the apparatus, said region bounded by at least part of a patient's body, said member and at least part of said positioner and extending about a patient's head;

c. evacuation means for partially evacuating said region to establish a pressure differential between atmosphere surrounding the apparatus and said region, said pressure differential providing differential pressure forces exerted on at least part of the patient's body via said member for holding a patient against said positioner;

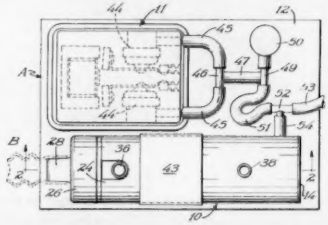
d. face mask means for maintaining said member spaced from at least part of a patient's face and for enabling a patient to breath air in said region while being held in place against said positioner.

3,851,645

INHALATION ANESTHESIA DEVICE

Allan A. Connel, P.O. Box 23, Stillwater, Minn. 55082

Filed Apr. 18, 1973, Ser. No. 352,338
Int. Cl. A61m *17/00*
U.S. Cl. 128—188 **9 Claims**



1. An inhalation anesthesia device including

an elongated chamber,

an end closure at one end of said chamber,

an end closure at the other end of said chamber,

a first partition extending across said chamber in spaced relation to said one end closure defining, therebetween, a receiving chamber,

an inlet to said receiving chamber,

means supplying pressurized gas to said inlet,

a second partition in spaced relation to the other end of said chamber defining a delivery chamber therebetween,

an outlet from said delivery chamber,

means for connecting said outlet to a patient;

a by-pass within said elongated chamber extending between said first and second partition connecting said receiving chamber and said outlet chamber,

a plurality of spaced foraminous absorbent members extending across said elongated chamber between said partitions capable of absorbing anesthetic liquid in said elongated chamber,

an inlet passage through said first partition,

an outlet passage through said second partition,

a flap valve intercepting said by-pass and one of said passages regulating the flow of fluid through said by-pass and through the portion of said elongated chamber between said partitions outwardly of said by-pass and operable to open said by-pass and close said one passage, open said one passage and close said by-pass, or proportion the flow through said by-pass and said one passage.

3,851,646

CONNECTOR FOR OPEN HEART SURGERY

Richard N. Sarns, Ann Arbor, Mich., assignor to Sarns, Inc., Ann Arbor, Mich.

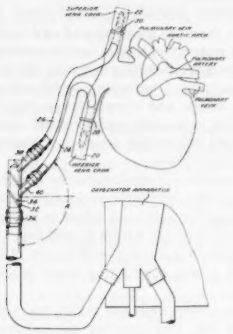
Filed Apr. 13, 1973, Ser. No. 351,083
Int. Cl. A61m *5/00, 25/00;* **F16l** *41/02*
U.S. Cl. 128—214 R **1 Claim**

1. In apparatus for open heart surgery wherein cannulae are adapted to lead from the inferior vena cava and the superior vena cava, respectively, for transmitting low pressure venous blood to a tube leading to a pump oxygenator, the improvement which comprises:

a. a connector including an elongate body having an axial passage blind at one end of the body and open at the other end,

b. means at said other end for connection to the tube leading to the pump oxygenator,

c. a pair of spaced branch arms integrally connected with said body lying on one side of said body in a plane common to the axis of said axial passage and extending at an angle to said body and having passages to flow into said axial passage, one at about the blind end of said passage



and the other spaced approximately an inch from said blind end, said arms having an obtuse angle of about 130° to 140° to the axis of said axial passage, and

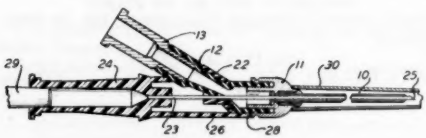
d. means on the ends of said branch arms for connection of the respective cannulae from said inferior and superior venae cavae.

3,851,647

INTRAVENOUS CATHETER INTRODUCTION ASSEMBLY

Martin Monestere, Jr., Lebanon, and Vincent L. Vaillancourt, Livingston, both of N.J., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Mar. 7, 1973, Ser. No. 338,777
Int. Cl. A61m *05/00*
U.S. Cl. 128—214.4 **5 Claims**



1. An intravenous needle and catheter combination comprising a plastic catheter having a tapered distal end and a hub, a flexible tube of elastic material secured at its distal end to said hub, an adapter-hub engaged with the proximal end of said tube, a needle having a beveled point removably inserted through a wall of said tube at a point of entry intermediate said hub and adapter-hub and extending through the lumen of said catheter, and separate mechanical means on said tube for closing said point of entry after removal of the needle, wherein said mechanical means is a separate element movable between needle-passing position and entry-closing position.

3,851,648

ZERO-ORDER RELEASE DEVICE

Dana Brooke, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

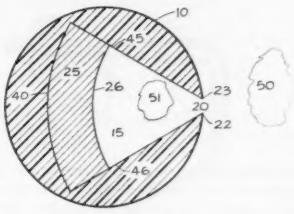
Filed Oct. 11, 1973, Ser. No. 405,616
Int. Cl. A61m *31/00, 7/00*
U.S. Cl. 128—260 **17 Claims**

1. A device for the automatic release at a substantially constant predetermined rate of a diffusible solid into a fluid medium into which said solid has a propensity to diffuse when said device is immersed in said medium which comprises,

a container which is insoluble in said medium, impermeable thereto, and impermeable to said solid,

said container having a slot in the surface thereof defining an elongated opening of uniform length and width having two ends and two sides with the narrower dimension at the ends and the longer dimension at the sides, said slot communicating in its entirety with

an internal cavity within said container said cavity being defined by an accuate wall and



a pair of parallel congruent planar end walls arranged at right angles to said slot and adjacent the ends thereof,

and a pair of inwardly extending congruent planar side walls adjacent the opposite sides of said slot and in substantially divergent radial relation to said slot, and extending to said rear wall.

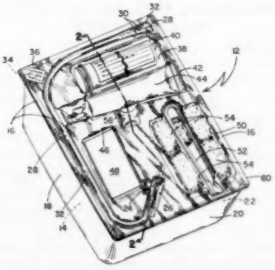
a means for diffusing said solid from within said cavity into the immersing medium including a diffusible solid housed within said cavity as a homogenous mass in bonded relation to the inner wall surface of the cavity and having a surface thereof facing and opposing said slot opening to expose the diffusable solid surface to said fluid medium when said device is immersed therein.

3,851,649

CATHETERIZATION PACKAGE

Frank K. Villari, Oak Park, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Mar. 21, 1973, Ser. No. 343,220
Int. Cl. A61f *5/44*
U.S. Cl. 128—275 **5 Claims**



1. A catheterization package comprising

an enclosed rigid container including a rear panel and a rigid front panel spaced from one another with a top wall, side walls and a bottom wall extending therebetween

said front panel having a recessed catheter drainage port with a catheter connected thereto adjacent the upper and one side wall of said container, said catheter being positioned within an open sided recess in said front panel with said port at one end thereof

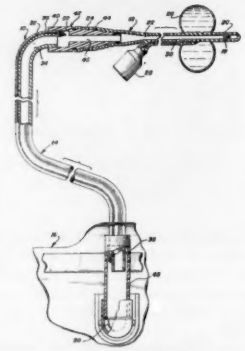
said container being utilized for collection of liquid drained through said catheter.

3,851,650

CLOSED DRAINAGE SYSTEM WITH DOUBLE LUMEN TUBE

Phillip H. Darling, Elm Grove, Wis., assignor to The Kendall Company, Boston, Mass.

Filed June 6, 1972, Ser. No. 260,085
Int. Cl. A61m *27/00*
U.S. Cl. 128—350 R **5 Claims**



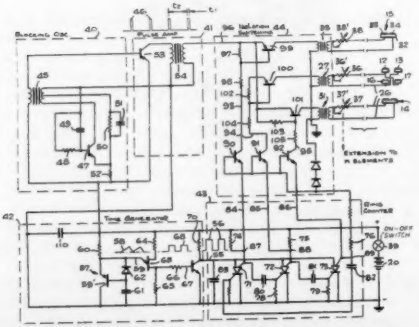
1. A closed system for drainage of liquid from a cavity comprising a tubular conduit having a single liquid inlet opening insertable into the cavity and a downwardly extending section, a drainage receptacle in a position to receive liquid from said conduit, the downwardly extending section including a drainage tube having two lumens which are in communication at the upstream end of the tube and adjacent the downstream end of the tube, one-way valve means adjacent the upstream end of one of said lumens for permitting the passage of liquid into the one lumen, said valve means comprising a flap valve.

3,851,651

FACIAL STIMULATING APPARATUS HAVING SEQUENTIALLY ENERGIZED ELECTRODES

Phineas J. Icenbice, Jr., 19323 Halsted, Northridge, Calif. 91324

Filed Dec. 22, 1972, Ser. No. 317,725
Int. Cl. A61n *1/36*
U.S. Cl. 128—422 **7 Claims**



1. In facial stimulating apparatus including a plurality of electrode means to be positioned near and stimulate different facial nerves respectively, the combination with said electrode means of:

a first oscillator producing first pulses at a relatively high frequency to be delivered to and energize said electrode means, said first pulses being of very short duration with intervals between successive pulses much longer than the pulses themselves;

a second oscillator producing control pulses at a frequency much lower than the frequency of said first pulses;

a ring counter connected to said second oscillator for actuation thereby and including a series of semi-conductor switches actuable between conducting and non-conducting states, and circuit means responsive to said control pulses to actuate said switches successively to a predetermined one of said states in a sequence repeating through many cycles;

a plurality of additional semiconductor switches connected between said first oscillator and said different electrode means respectively and each actuable between a conducting state for delivering a train of said first pulses from the first oscillator to a corresponding one of said electrode means and a non-conducting state blocking off such pulses; and

circuit means connecting said additional switches to said switches of the ring counter respectively for control thereby in a relation to simultaneously, in response to the same control pulse from said second oscillator, commence conduction of said first pulses through one of said additional switches to the corresponding electrode means and at the same time terminate conduction through a preceding one of said additional switches to the preceding electrode means,

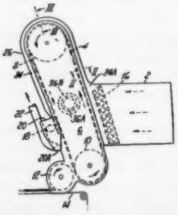
said second oscillator having a frequency causing each of said additional switches, on each actuation, to pass to the corresponding electrode means a pulse train consisting of many of said first pulses but continuing for not more than a few seconds.

3,851,652

CIGARETTE MAKING MACHINES

Francis Auguste Maurice Labbe, Neuilly-Sur-Seine, France, assignor to Mollins Limited, London, England

Filed July 27, 1972, Ser. No. 275,633
Claims priority, application Great Britain, July 28, 1971, 35514/71
Int. Cl. A24c *05/18*
U.S. Cl. 131—84 C **9 Claims**



1. In a cigarette making machine, a filler stream forming arrangement comprising an upper pulley and a lower pulley; an air pervious band arranged to move around the pulleys and having an upwardly moving run moving from the lower pulley to the upper pulley, and a downwardly moving run moving from the upper pulley to the lower pulley; a suction chamber between the two runs of the band for applying suction through the band to hold tobacco on the band; means for feeding tobacco towards the upwardly moving run of the band to build up a cigarette filler stream on the band, means supplying a continuous wrapper web near the bottom of the downwardly

moving run of the band for enclosing the cigarette filler stream; and a transfer conveyor adjacent to the lower pulley arranged to receive the cigarette filler stream from the band, the filler stream being transferred from the band to the wrapper web by the transfer conveyor near the bottom of the downwardly moving run of the band.

3,851,653

METHOD OF PUFFING TOBACCO AND REDUCING NICOTINE CONTENT THEREOF

William E. Rosen, Lafayette Hill, Pa., assignor to Rosen Enterprises, Inc., Lafayette Hill, Pa.

Filed Oct. 11, 1972, Ser. No. 296,739The portion of the term of this patent subsequent to Oct. 12, 1988, has been disclaimed.
Int. Cl. A24b *15/02, 03/18*
U.S. Cl. 131—140 P **19 Claims**

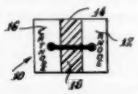
1. A method of treating tobacco comprising the steps of contacting said tobacco with an aqueous solution containing a given amount of hydrogen peroxide and providing on said tobacco a given amount of catalase, said hydrogen peroxide solution contacting said tobacco no later than said catalase, said given amount of catalase being effective to cause decomposition of said given amount of hydrogen peroxide and said given amount of hydrogen peroxide upon decomposition being effective to increase the volume of said tobacco.

3,851,654

SELF CONTAINED ELECTROCHEMICAL HEAT SOURCE

Frederick P. Kober, Bayside, N.Y., assignor to Chem-E-Watt Corporation, Valley Stream, N.Y.

Division of Ser. No. 175,846, Aug. 30, 1971, Pat. No. 3,774,589. This application Aug. 17, 1973, Ser. No. 389,236
Int. Cl. A45d *2/12*
U.S. Cl. 132—33 **4 Claims**



1. In a heating device for hair waving operations the combination comprising

a shell formed of a hair heat protective material and having a cell receiving recess,

an electrochemical cell shaped to fit within the recess in heat transferring relationship with the shell, said electrochemical cell including

an electrochemical cell structure formed of a generally thin electrically conductive first member made of an electrochemically active oxidizable material and a generally thin electrically conductive second member made of an electrochemically active non-metallic reducible material, said first and second members having therebetween, said first and second members being further selected for forming an electric heating current producing electrochemical couple capable upon electrical interconnection of the members of heating the electrochemical cell structure to a temperature which is sufficiently high for forming said self-contained heat source; and

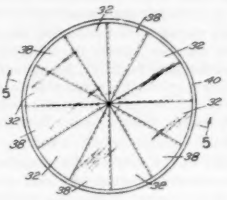
a multiple of discrete electronically conductive elements extending between the electrochemically active oxidizable first member and the electrochemically active reducible second member for electrical contact therewith, said electronically conductive elements being spaced and selected to conduct an electric heating current between the first oxidizable member and the second reducible member for a uniform heating of the electrochemical cell structure during activation of the electrochemical cell to dissipate electrical cell energy within the shell to form heat for hair waving.

3,851,655

METHOD AND MEANS FOR SELECTING COSMETICS

Richard E. Tarro, 425 Broadway, Providence, R.I. 02909

Filed Oct. 15, 1973, Ser. No. 406,658
Int. Cl. A45d *40/00*
U.S. Cl. 132—83 **14 Claims**



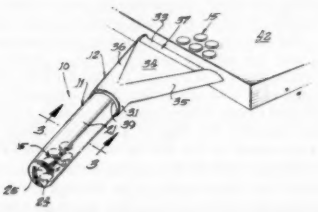
1. A cosmetic selecting device comprising a container for a cosmetic, means for sealing the cosmetic in the container, said means having a transparent portion allowing a view of the cosmetic, and means allowing a view of the selector's skin adjacent the visible cosmetic.

3,851,656

DEVICE FOR COLLECTING, CONTAINING AND DISPENSING MARKERS FOR GAMES

William M. Haas, 505 Ivy St., Pittsburgh, Pa. 15232, and Richard P. Merzlak, 133 Hetherton Dr., Pittsburgh, Pa. 15237

Filed Aug. 21, 1973, Ser. No. 390,199
Int. Cl. A63f *9/00*
U.S. Cl. 133—5 A **2 Claims**



1. A device for collecting, containing and dispensing disc shaped bingo chip type markers for use in the playing of the game of Bingo, the device comprising the combination of:

a longitudinally elongated hollow body member formed of a material having the qualities of elasticity and resiliency, the body having a closed dispensing end and a diametrically opposite open receiving end with a hollow compartment being defined interiorly of the body for receiving therein a plurality of markers in a random manner, said body member having side walls extending between said dispensing end and said receiving end defining an elongated tubular shape for said body member having an oval cross-section viewed through a plane taken normal to the longitudinal axis at the dispensing end of the body member with said cross-sectional area slowly changing in a graduated transition manner progressively along the body member in the direction of the receiving end until a circular cross-sectional area is defined at the open receiving end of said body member, said body member adapted to be held in one hand of an individual in a comfortable and operative manner;

a dispensing opening for said markers formed integrally in said closed dispensing end of said body member, said

opening being in the form of a rectangular slot extending radially to the axis of the body member, said slot being longer than the diameter of the individual markers and being of a lesser width than the thickness of the individual markers thus preventing any marker from passing through said slot when the slot is in the normal inoperative position, the side edges defining said slot being distortable upon an individual applying compressive pressure to the body member adjacent the dispensing end thereof by a squeezing type movement of the hand holding the body member thus distorting the dispensing end of the body member against the inherent elasticity and resiliency of the body member, this squeezing type movement exerting opposed forces generally axially of said slot to effect the distortion of said slot in a manner decreasing the overall length thereof while distortingly increasing portions of the width thereof to a width greater than that of a plurality of the markers for dispensing a selective number of markers therethrough, said slot automatically returning to its normal inoperative undistorted position upon release of the squeezing pressure of the user due to the inherent elasticity and resiliency of the body member; a hollow chip loading funnel member having one end detachably connected to the receiving end of said body member in communication with the interior of said body member, the funnel member being connected with the body member such that a cover member is interchangeable with the funnel member, said one end of the funnel member including a hollow cylindrical collar portion having an interior diameter to be snugly received in a telescopic manner over said receiving end of said body member, the opposite end of said funnel member being of an enlarged cross-sectional area relative to said collar portion, said opposite end including a hollow triangular portion connected at its apex to the collar portion and extending outwardly therefrom at an angle thereto relative to the longitudinal axis of the collar portion, said triangular portion including a top surface, a bottom surface, and opposed side surfaces defining a hollow marker receiving chamber therebetween, said bottom surface extending outwardly from a bottom edge of said cylindrical collar portion a distance greater than said top surface with said top surface overlying only a portion of said bottom surface, that portion of said bottom surface not overlapped by said top surface being exposed to define a lip portion having a forwardmost free edge adapted to be placed adjacent the edge of a playing surface with the markers resting on the playing surface readily pushed by the individual user off the playing surface and onto the lip portion from whence they slide through the funnel into the attached body member, said body member and attached collar portion being disposed at a concave angle relative to said triangular portion;

said cover member interchangeable with said funnel member for detachable connection to said receiving end of said body member to close said receiving end for containing the markers in the body during periods of transportation and storage between times of usage, said cover member being of a cylindrical shape having a flat top surface and depending cylindrical side walls defining an interior circular recess of a diameter adapted to be snugly received over the exterior surface of said body member receiving end to close said end;

screw threads disposed about the exterior of said body member side walls adjacent said receiving end thereof;

screw threads formed interiorly of said funnel member collar portion to engage threadingly with said body member screw threads for detachably connecting the funnel member on said body member; and

screw threads formed interiorly of said cover member cylindrical side walls to threadedly engage with said body member screw threads for detachably connecting the cover member on said body member interchangeably with said funnel member.

3,851,657

HANDLE FOR UMBRELLA

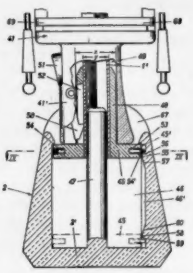
Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada

Continuation of Ser. No. 164,736, July 21, 1973, abandoned. This application Aug. 20, 1973, Ser. No. 389,499

Claims priority, application Germany, July 24, 1970, 2036701

Int. Cl. A45b *9/02*

U.S. Cl. 135—46 M **5 Claims**



1. In a collapsible umbrella including a handle mounted at one end of a hollow stick comprising a plurality of telescopic sections having cross sections respectively decreasing from the handle, the handle having an axial recess defined by side and bottom walls, a centering stem fixed to the bottom wall and extending axially within the lowermost stick section of the umbrella stick for guiding relative movement therebetween, a sleeve telescopically and fixedly secured about the lowermost stick section and increasing the cross section of the stick section thereat, said sleeve having a slot therealong for removably receiving a lock lever catch therein, said sleeve including an integral flange having a periphery substantially conforming to the axial recess of the handle and reciprocatable therein; limiting stop means operatively connected between said handle and said stick and sleeve flange for limiting flange movement of said flange relative to the handle recess during an extended or retracted position corresponding to respective erected or collapsed conditions of the umbrella; and a main runner slidably mounted on said stick and having catch-lever-and-catch means thereon and including a catch displacably engagable with the slot along said sleeve, said runner having a cross-section receivable in the axial recess of said handle and movable into the axial recess when the umbrella is collapsed.

3,851,658

VALVE

Alan Donald Bunyard, Haywards Heath, England, assignor to Norbro Pneumatics Limited, Sussex, England

Filed Aug. 7, 1970, Ser. No. 61,932

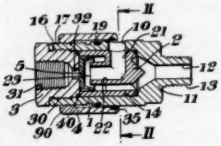
Claims priority, application Great Britain, Aug. 9, 1969, 39966/69

Int. Cl. F16k *11/02*

U.S. Cl. 137—102 **8 Claims**

1. A valve comprising an elongated hollow body having an axial bore extending therethrough, an inlet port at one end, an outlet port near the other end and an exhaust port intermediate the ends of the body, an elongated removable insert in said bore having a first passageway extending axially from end-to-end of the insert and communicating at both ends with said bore and a second passageway extending from one end to the periphery of the insert and communicating with said exhaust port, a cup seal of resilient material having a bottom wall and a peripheral rim disposed within the bore of said hollow body with its bottom wall adjacent said inlet port and transverse to

the axis of the bore and its rim engaging said insert at the entrance to said first passageway, said cup seal being bodily movable between two positions in response to pressure differentials across the valve at said inlet and outlet ports, said cup seal in its first position having its bottom wall against and closing said inlet port and its rim distended to permit communication between said first and second passageways of said insert through the interior of said cup seal so that a fluid flow path is established from the outlet port through the first and



second passageways in sequence to the exhaust port, said cup seal in its second position having its bottom wall against and closing said second passageway and its rim compressed inwardly to open the first passageway so that a fluid flow path is established from the inlet port around the rim of the cup seal through the first passageway to the outlet port, whereby to control fluid flow either through the inlet port to the outlet port or through the outlet port to the exhaust port and the valve is selectively operable either as a fluid flow regulator or as a quick exhaust valve.

3,851,659

MEANS FOR ROTATABLY SUPPORTING AN OVERHEAD IRRIGATION PIPE

Arthur L. Zimmerer; Bernard J. Zimmerer, and Paul B. Zimmerer, all of Lindsay, Nebr., assignors to Lindsay Manufacturing Co., Lindsay, Nebr.

Filed Dec. 21, 1970, Ser. No. 100,156
Int. Cl. A01g *25/02*; **B05b** *3/12*
U.S. Cl. 137—344 **2 Claims**

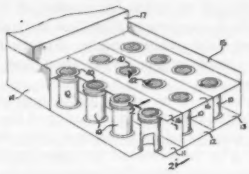
1. A self-propelled irrigation system comprising,
a water distribution pipe movable along a predetermined path,
means for supplying water to said pipe,
a plurality of spaced apart, self-propelled towers along the length of said pipe for supporting said pipe above the ground and to propel said pipe along said predetermined path,
at least some of said towers having a sleeve means thereon through which said pipe freely rotatably extends to permit said towers to traverse irregular ground without imposing twist stress in said pipe,
at least some of said towers being rigidly connected to said pipe so as to prevent rotational movement of those said towers with respect to said pipe.

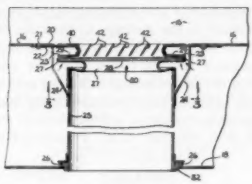
3,851,660

SELF OPERATING PRESSURE ACTUATED VALVE

Seymour Lieberman, Los Angeles, and Joseph Michael Rice, Manhattan Beach, both of Calif., assignors to Transtech, Manhattan Beach, Calif.

Filed Sept. 18, 1972, Ser. No. 289,872
Int. Cl. B65g *53/04*
U.S. Cl. 137—484.2 **15 Claims**





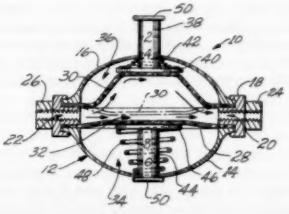
1. A self operating pressure actuated valve for controlling the flow of fluid from a first region to a second region which comprises:
a. a barrier between said first and second regions, said barrier having an opening therein for the passage of fluid; and
b. a poppet closure for said opening, said poppet being moveable to open or close said opening in response to pressure, the opening force for said poppet being the effect of the pressure in said second region acting through said opening upon a first portion of the surface of said poppet said opening force being opposed by a closing force from the effect of a substantially constant pressure upon a second portion of said poppet, said substantially constant pressure being lower than the pressure in said first region.

3,851,661

FLUID FLOW REGULATOR AND PRESSURE INDICATOR

John J. Fernandez, 1620 S. Myrtle Ave., Monrovia, Calif. 91016

Filed Feb. 14, 1973, Ser. No. 332,308
Int. Cl. G11b *7/08*
U.S. Cl. 137—558 **10 Claims**



1. A fluid flow regulating device including a housing having a hollow interior, and an inlet and outlet to the hollow interior,

the inlet being adapted for connection to source of fluid under pressure to be delivered to the interior of the housing, the outlet being adapted to conduct the fluid from the interior of the housing;

a pair of laterally spaced apart flexible diaphragms in the housing providing opposite movable walls of a fluid flow passage for conducting fluid through the housing from the inlet to the outlet;

separate biasing springs extending between the housing and each diaphragm to adjust the position of the respective diaphragms in response to fluid flow through the passage to dampen fluid pulses entering through the inlet and produce a substantially steady fluid flow through the outlet; and

separate indicator arms extending in opposite directions from each diaphragm to the exterior of the housing, the indicator arms being movable away from the exterior of the housing by movement of their associated diaphragms in response to increasing fluid pressure in the passage, the indicator arms being movable away from the housing through a distance of travel proportional to the amount of fluid pressure in the passage to indicate the instantaneous amount of said fluid pressure, one biasing spring having a greater biasing force than the other biasing spring so that the travel of one indicator arm will provide an indication of lower fluid pressure levels than the travel of the other indicator arm.

3,851,662

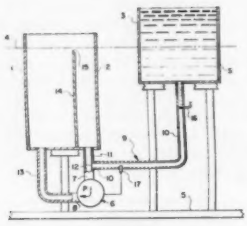
PHOTOGRAPHIC PROCESSING SOLUTION FILLING AND CIRCULATING APPARATUS

Thomas C. Jessop, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 18, 1973, Ser. No. 380,516

Int. Cl. E03b *7/07*

U.S. Cl. 137—563 **3 Claims**



1. A photographic processing solution filling and circulating apparatus, comprising:

a processing solution supply container;

a processing solution utilization container;

a processing solution circulation container;

means arranging said supply, utilization and circulation containers to provide fluid communication with each other for attaining, respectively therein, a common hydrostatic equilibrium level of the processing solution;

means providing for overflow of processing solution from said utilization container into said circulation container at an overflow level which is below the common equilibrium level;

a pump, disposed below the common equilibrium level, and having an inlet for the intake of processing solution and an outlet for the discharge of processing solution; and

a conduit disposed below the common equilibrium level, connecting said pump inlet with said supply and circulation containers to allow gravity flow of processing solution from said supply and circulation containers into said pump inlet, and connecting said pump outlet with said utilization container for pumping processing solution from said pump outlet into said utilization container.

3,851,663

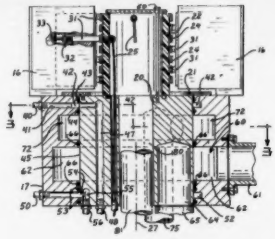
ROTARY COUPLING FOR ROTATING MILKING PARLORS

Chester G. Neuko, Jamestown, N. Dak., assignor to Circle Milking, Inc., Jamestown, N. Dak.

Filed July 18, 1973, Ser. No. 380,154

Int. Cl. F16l *27/08;* **A01j** *5/00*

U.S. Cl. 137—580 **2 Claims**



1. A rotary coupling for rotating milking parlors for carrying fluids and electric power from a stationary portion of the parlor to the rotating portion of the parlor, comprising a stationary member, a rotating member rotatably mounted with respect to said stationary member for rotation about a substantially central axis, means to support said rotary coupling with said central axis extending substantially vertically, said stationary and rotating members being concentrically mounted about said central axis, said stationary member comprising a housing defining a central opening and including a first section encompassing said rotating member and having a plurality of axially spaced, annular recesses defined therein, a plurality of conduits connected to said housing on the exterior of said first section, each conduit being open to one of said annular recesses, said conduits including at least one vacuum carrying conduit, and other conduits carrying fluid under pressure, separate passageways in said rotating member each aligning with one of said annular recesses in said first section of said stationary member, and said separate passageways in said rotating member including portions having axes substantially parallel to said central axis, means to couple said passageways in said rotating member to remote lines rotating with said rotating member, said rotating member having a central passageway extending completely through said rotating member, said coupling including a second portion for transmitting electrical power including electric annular slip rings on said rotating member and stationary brush means mounted on said housing, said annular slip rings and said brush means being postioned vertically above said first section of said housing carrying said annular recesses and said conduits, and seal means between each of the individual annular passageways in said stationary member and corresponding portions of said rotating member and passageway means in said rotating member for carrying electrical wires to said slip rings, said central passageway through said rotating member being a nonsealed passageway of size to permit a separate conduit to pass therethrough.

3,851,664

VALVES

Hanni Zadow, and Herbert Rudolph Julius Zadow, both of 17 Rosedale Rd., Heaton Chapel, Stockport, Chesire, England

Filed Nov. 10, 1972, Ser. No. 305,617

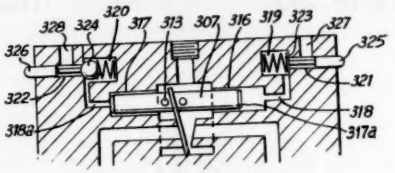
Claims priority, application Great Britain, Nov. 13, 1971, 52797/71

Int. Cl. F16k *31/12*

U.S. Cl. 137—596.15 **20 Claims**

1. A fluid flow control valve assembly comprising a first fluid flow control valve having a housing, a chamber in the

housing, an inlet port in communication with the chamber, at least one outlet port from the chamber, a plate-like valve member movable in the chamber in response to control means selectively to prevent or permit flow through said at least one outlet port, a second fluid flow control valve having a housing, a chamber in the housing, an exhaust port, an entry port in communication with said at least one outlet port, a further port in communication with the second valve chamber, a plate-like valve member movable in the second valve chamber alternatively to prevent communication between the further port and the outlet port while allowing communication between the further port and the entry port or to obstruct communication between the further port and the entry port and



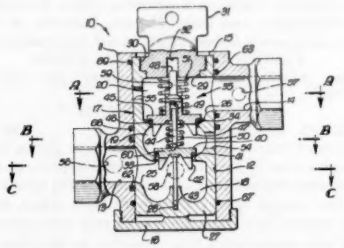
allow communication between the further port and the outlet port, said control means comprising an operating member engageable with the plate-like valve member of the first valve to move the plate positively in two opposed directions, the ends of the operating member being reciprocable in bores leading from opposed walls of said first valve chamber, passages communicating respectively with the bores and containing normally closed valve ports, means for providing communication between the first valve inlet port and said passages, and operating means operatively connected with further valve members associated with the normally closed valve ports for opening same, the operating member blocking communication between the first valve inlet port and the respective passage at the limits of movement of the first valve member.

3,851,665

TESTABLE PLUG SHUT-OFF AND DOUBLE CHECK VALVE

Donald W. Coughlin, P.O. Box 535, Lake Arrowhead, Calif. 92352

Filed Aug. 9, 1973, Ser. No. 386,987
Int. Cl. F16k *43/00*
U.S. Cl. 137—614.17 **7 Claims**



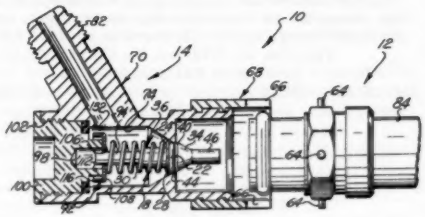
1. A combination plug shut-off and check valve comprising:
a valve body having a vertical bore and lengthwise offset inlet and outlet connections opening into upper and lower portions of said bore,
said valve body also having two drain-and-valve-testing port means located respectively at the levels of said connections and on bore radii disposed approximately 90° from alignment with said connections;
a valve plug rotatably fitting within said bore and having an axial cavity closed at the top and bottom of the plug and having lower and upper chambers, said plug having open and closed positions separated by a quarter turn of said plug in said bore,
the wall of said plug having passage means, which, with said plug in open position, provide communication between said lower chamber and said inlet connection and between said upper chamber and said outlet connection,
said passage means, with said plug in closed position providing communication between said lower and upper chambers respectively and said two drain and valve testing port means in said valve body,
said plug having imperforate peripheral areas which shut said inlet and outlet connections when said plug is in closed position; and
check valve means mounted in said cavity and controlling liquid flow between said lower and upper cavity chambers and limiting said liquid flow to an upward direction.

3,851,666

COUPLING ASSEMBLY

Harry H. Hammond, Middleburg Heights, Ohio, assignor to The Hansen Manufacturing Company, Cleveland, Ohio

Filed Mar. 9, 1973, Ser. No. 339,701
Int. Cl. F16l *37/28*
U.S. Cl. 137—614.04 **5 Claims**



1. A coupling assembly operable between a connected condition interconnecting first and second conduits and a disconnected condition, said coupling assembly comprising plug and socket means for connecting the first and second conduits in fluid communication, said socket means including a socket body defining a first valve chamber having inlet and outlet openings through which fluid enters and leaves said first valve chamber and first valve means for blocking fluid flow through said socket means when said coupling assembly is in the disconnected condition, said first valve means including a first frustro-conical valve seat connected with said socket body and circumscribing one of said openings to said first valve chamber, a first valve member disposed in said first valve chamber and movable relative to said first valve seat between an open position and a closed position, said first valve member including a cylindrical nose portion, a frustro-conical pilot portion disposed inwardly of said nose portion with a minor end of said pilot portion connected to the nose portion and a major end of the pilot portion spaced inwardly of the nose portion, said major end of said pilot portion having a diameter which is less than the diameter of said one of said openings, annular recess means disposed inwardly of said major end of said pilot portion for receiving an annular seal member, an annular seal member disposed in said recess means, said seal member having an outside diameter which is greater than the diameter of the major end of said frustro-conical pilot portion and the diameter of said one of said openings, a circular support portion disposed inwardly of said annular seal member and having a leading end with an exter-

nal diameter which is greater than the external diameter of said annular seal, said leading end of said circular support portion having a circular support surface which forms an inner side of said recess means, and first spring means for urging said first valve member toward the closed position, said major end of said pilot portion being disposed outwardly of said first valve seat when said first valve member is in the closed position to enable said seal member to be pressed against said first valve seat under the influence of said spring means, said leading end of said circular support portion being disposed in abutting pressure engagement with said first valve seat and an inner side of said seal member when said first valve member is in the closed position to press said seal member against said first valve seat and to limit the pressure applied to said seal member to thereby prevent excessive deformation of said seal member, said plug means including a plug body defining a second valve chamber having inlet and outlet openings through which fluid enters and leaves said second valve chamber and second valve means for blocking fluid flow through said plug means when said coupling assembly is in the disconnected condition.

3,851,667

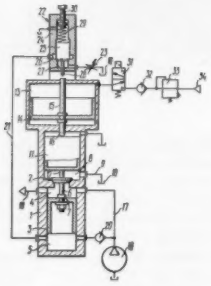
PULSATOR FOR HYDRAULIC SYSTEMS CONTROLLING ACTUATING MECHANISMS

Vladimir Ivanovich Goryainov, 50, kv. 2 p/o Chelobatievo, Mytischnsky raion, Moskovskaya Oblast; Ivan Vasilievich Kononov, 40, kv. 4 ulitsa Torpedo, Vorenezh; Ivan Egorovich Maslennikov, 26, kv. 82 ulitsa Druzhinnikov, Vorenezh; Vladimir Nikiforovich Platonov, ulitsa 9 Yanvarya 49, kv. 45, Vorenezh, and Vyacheslav Evgenievich Popov, ulitsa Peshe Streletskaya 125, kv. 76, Vorenezh, all of U.S.S.R.

Filed Feb. 13, 1973, Ser. No. 332,152

Int. Cl. F01l *9/02*

U.S. Cl. 137—624.14 **3 Claims**



1. A pulsator for hydraulic systems controlling actuating mechanisms comprising: a housing; a delivery valve disposed in said housing; an air cylinder having a movable element and adapted for closing said valve, said air cylinder being disposed in said housing coaxially with said delivery valve at one of its ends; a pusher rigidly connected to said delivery valve disposed in said housing coaxially with said valve at its opposite end and serving for opening said delivery valve; a first cavity between said delivery valve and pusher, permanently communicating with a high-pressure main of the hydraulic system and with an actuating mechanism; a second cavity above the valve, communicating with a liquid drain main of the hydraulic system; a third cavity below said pusher; pipelines for connecting said third cavity to said high-pressure and drain mains, respectively; a non-return valve mounted on said pipeline connecting said third cavity to said high pressure main; a throttle mounted on said pipeline connecting the third cavity to said liquid drain main; a valve unit having a movable element mounted on said pipeline ahead of said throttle; the movable element of said valve unit serving to shut off said pipeline as said delivery valve is opened and to be actuated by the movable element of said air cylinder at the end of the delivery valve opening stroke in order to connect said pipeline to said liquid drain main as the delivery valve is closed.

3,851,668

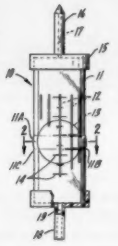
FLOW CONTROL DEVICE

Thomas A. Benjamin, Deerfield, Ill., assignor to Medical Environment Devices Incorporated, Wheeling, Ill.

Filed July 27, 1973, Ser. No. 383,247

Int. Cl. F15d *1/10;* **F16k** *3/22*

U.S. Cl. 137—625.3 **11 Claims**



1. A flow control device comprising:

an elongated flexible tube of a given length with an interior surface of given diameter, generally axially extending channel means formed in the interior surface of said flexible tube, the cross sectional flow area of said channel means varying in an axial direction,

a rigid ball with a diameter greater than said interior surface diameter of said tube wherein said ball is capable of being firmly lodged within said elongated tube to form a seal between said ball and said interior surface of said tube exclusive of said channel means, said ball being capable of being axially moved within said tube by external squeezing force applied to said tube to control fluid flow through said tube.

3,851,669

CONTROL FACE ARRANGEMENT FOR AN AXIAL PISTON MACHINE

Gustav Zellbeck, Esslingen-Hegensberg; Dieter Bertsch, Stuttgart-Mohringen, and Dieter Hofsass, Fellbach, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 18, 1973, Ser. No. 324,895

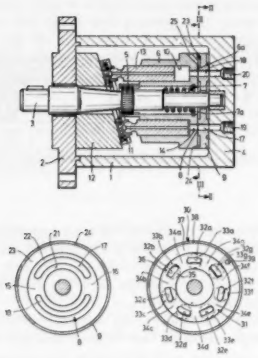
Claims priority, application Germany, Jan. 25, 1972, 2203278

Int. Cl. F01b *1/00, 13/04*

U.S. Cl. 137—625.21 **10 Claims**

1. Control face arrangement for an axial piston machine with suppression of unequal wear of the support rim relative to the sealing face portions, comprising housing means including a first control face; and cylinder body means having a second control face cooperating with said first control face, one of said means being rotary relative to the other means together with the respective control face; said first control face being formed with a pair of part-circular inlet and outlet ports, and having first separating face portions between the ends of said inlet and outlet ports and first outer and inner annular sealing face portions radially outward and inward of said inlet and outlet ports and subjected to wear by particles flowing with fluid through said inlet and outlet ports; said second control face being formed with a plurality of cylinder ports, and having second separating face portions between the

ends of said cylinder ports and subjected to wear by said particles; at least one of said first and second control faces having circular axially projecting peripheral support rim means abutting the respective other control face and exteriorly bounding an annular groove and being of a narrow radial width between 0.5% and 2.5% of the outer diameter of said support rim means and operative to suppress the formation of



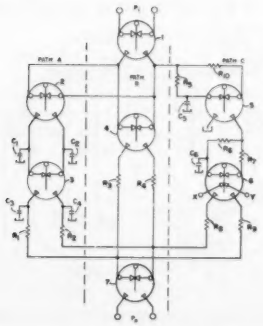
a hydrodynamic pressure field between said support rim means and the corresponding circular peripheral face portion of the respective other control face, whereby due to the suppression of the hydrodynamic pressure field between said support rim means and said corresponding peripheral face portion the rate of wear of said support rim means is substantially equal to the rate of wear of said sealing face portions which is caused by said particles.

3,851,670

FLUIDIC FREQUENCY FILTER

Carl G. Ringwall, Scotia, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 12, 1973, Ser. No. 378,488
Int. Cl. F15c *1/14*
U.S. Cl. 137—814 **8 Claims**



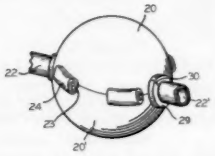
1. A fluidic frequency filter including first, second, and third parallel fluid paths having a common fluidic signal input; a fluidic output summer for said paths; said first fluid path including fluidic frequency sensitive means for introducing a time lag to signals on said input; said second fluid path including fluidic means for providing a proportional gain to signals on said input; and said third fluid path including fluidic frequency sensitive means for introducing a time lag and fluidic means for providing a gain k to signals on said input whereby k is greater than 1.

3,851,671

SNAP-ON LEAK PROOF CLAMP

John H. Miller, Rt. 4, Box 300, Manitowoc, Wis. 54220

Filed Jan. 2, 1973, Ser. No. 320,158
Int. Cl. F16l *55/16*
U.S. Cl. 138—99 **3 Claims**



1. A snap-on leak proof clamp assembly for preventing or repairing leakage at the coupling of underground pipelines,

said clamping assembly comprising a plastic housing sufficiently large to non-contiguously enclose ball type couplings,

said housing comprising first and second semi-spherical sections having flat contact surfaces on the ends thereof, said housing having spherical shape and including openings for the ingress and egress of said pipelines,

said openings including gasket means for sealing the openings around the pipelines,

the first of said sections including a circumferential groove on the flat contact surfaces end thereof,

said second section flat contact end surface including circumferential tongue means for fitting into said groove to seal said spherical housing when said first and second sections are forced together,

flange means integrally formed on each end of each of the sections at the junction point of each of said sections, and a plurality of resilient clamps slidable over said flange means for sealing said sections together to seal said spherical housing.

3,851,672

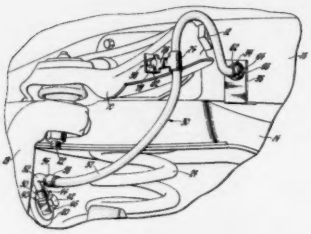
HOSE ASSEMBLY WITH PREPOSITIONED HOSE MOUNTING BRACKET

Patsy De Vincent, Dayton, and John V. Hepke, Vandalia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 18, 1973, Ser. No. 361,781
Int. Cl. F16l *3/12*
U.S. Cl. 138—106 **2 Claims**

1. A hose assembly including a flexible hose of a predetermined length, a first hose fitting secured to one end of said hose and having mounting orientation means thereon, a second hose fitting having orientation guide means thereon, said second hose fitting being secured to the opposite end of said hose with said orientation guide means thereon at a predetermined angular relation with respect to said mounting orientation means of said first hose fitting when said hose is in a straight, relaxed, untwisted condition and, a hose support bracket having a hose clamp portion and an apertured mounting flange, said hose clamp portion of said hose support bracket being secured to said hose intermediate the ends thereof at a predetermined distance from said mounting orien-

tation means of said first hose fitting with said apertured mounting flange located at a predetermined angular relation-



ship relative to said orientation guide means of said first hose fitting when said hose is in said straight, relaxed, untwisted condition.

3,851,673

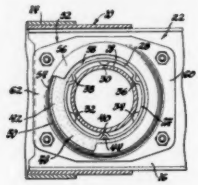
MOUNTING ASSEMBLY FOR EXHAUST PIPE

Ralph H. Merkle, Brighton, and Malcolm H. Humbert, Pontiac, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 21, 1973, Ser. No. 362,466

Int. Cl. F16l *3/00*

U.S. Cl. 138—106 **2 Claims**



1. A mounting assembly for resiliently supporting an exhaust pipe within an aperture provided in a vehicle frame, said mounting assembly including a tubular collar having an inner diameter larger than the outer diameter of said exhaust pipe and adapted to encircle a portion of the exhaust pipe within said aperture, said collar having a pair of opposed end portions provided with circumferentially spaced and radially inwardly projecting dimples, means securing said dimples at spaced points to the outer surface of the exhaust pipe so as to provide an annular air space between said outer surface and said collar for air to flow therethrough, a ring-shaped grommet of elastomeric material adapted to be frictionally supported by said collar, a retainer bracket having a well formed therein corresponding in configuration to said grommet, a circular opening centrally formed in said well having a diameter greater than the outer diameter of said collar, said retainer bracket adapted to receive the grommet in said well and compressively secure a portion of said grommet to said frame so as to allow said exhaust pipe to be resiliently supported for longitudinal and radial movement relative to said frame.

3,851,674

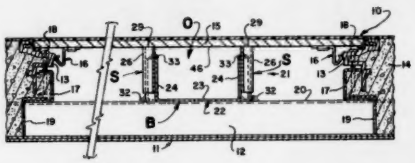
SUPPLEMENTARY RACEWAY FOR AN UNDERFLOOR ELECTRICAL CABLE TRENCH

Frank W. Fork, Allison Park, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Dec. 27, 1971, Ser. No. 212,499

Int. Cl. F16l *9/00*

U.S. Cl. 138—173 **6 Claims**



1. In a supplementary raceway having a generally U-shaped configuration including a bottom wall provided with longitudinally spaced-apart openings and upstanding side walls integrally formed along the opposite longitudinal edges of said bottom wall, the improvement comprising:

said upstanding side walls having vertically presented corrugations which enhance the column strength of the said side walls, said side walls presenting sinuous upper edges;

side plates, one adjacent to each of said upstanding side walls and adjustable relative thereto, each of said side plates being provided with vertically presented corrugations mating with the said corrugations of said side walls; and

means for securing each of said side plates to the adjacent upstanding side wall in vertically adjusted relation.

3,851,675

POSITIVE DOBBY

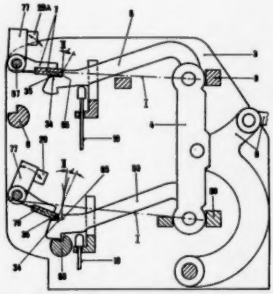
Rudolf Schwarz, Horgen-Zurich, Switzerland, assignor to Staubli Ltd., Horgen-Zurich, Switzerland

Filed Mar. 22, 1973, Ser. No. 343,888

Claims priority, application Switzerland, Mar. 28, 1972, 4627/72

Int. Cl. D03c *1/06*

U.S. Cl. 139—71 **17 Claims**



1. A positive dobby of the Hattersley type, comprising:

a baulk;

draw hooks extending from and pivoted on the ends of said baulk for patterned movement, said draw hook having a normal, lifted position and a further, lower position;

draw knives mounted for back-and-forth movement beneath corresponding draw hooks and engageable with

corresponding lowered draw hooks;

a stationary member engageable by the pivoted end of said draw hooks;

pivotable stop means extending toward and overlying said draw hook and in one position thereof tightly longitudinally pressing against said draw hook in the normal lifted position of the latter for longitudinally urging said draw hook against said stationary member, wherein longitudinally opposed locking surfaces of said stop means and draw hook abut in a tight, play-free manner at a location between the pivot axis joining said draw hook to said baulk and the pivot axis of said stop means, said stop means including a portion thereof positively engageable with the upper side of said draw hook for pushing transversely thereon;

drive means adapted to urge said pivotable stop means out of said one position in a direction toward said draw hook for positively pushing said draw hook toward its further, lower position.

3,851,676

WEFT THREAD INSERTING DEVICE FOR SHUTTLELESS LOOMS

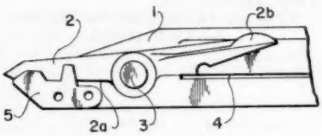
Nikolaus Kokkinis, Eriskirch, Germany, assignor to Lindauer Dornier Gesellschaft mbH., Lindau/Bodensee, Germany

Filed May 15, 1973, Ser. No. 360,430

Claims priority, application Germany, Aug. 14, 1972, 2240009

Int. Cl. D03d *47/20*

U.S. Cl. 139—122 N **2 Claims**



1. In a weft thread inserting device for shuttleless looms comprising gripper rods which move in a reciprocating fashion and laterally engage into the shed, and wherein gripper heads positioned at the forward end of the gripper rods are equipped with clamping means for the weft thread comprising a movable clamping part and a stationary counter bearing,

the improvement comprising a soft elastic base means mounted at the counter bearing, and rigid, wear resistant top means floatingly positioned thereon.

3,851,677

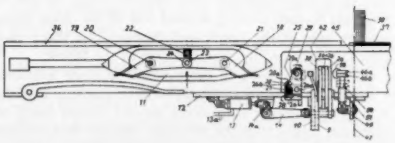
SHUTTLE LOOM

Werner Rossborg, Hamburg, Germany, assignor to Alfa-Laval Bergedorfer Eisenwerke GmbH, Hamburg, Germany

Filed Aug. 13, 1973, Ser. No. 387,068

Int. Cl. D03d *47/24;* **D03j** *5/06*

U.S. Cl. 139—125 **21 Claims**



1. In a shuttle loom, a combination comprising a sley, a shuttle track on said sley, at least one shuttle having gripper means for releasably engaging a weft thread to be inserted by said shuttle into a warp shed, guide means for guiding a weft thread drawn from a weft thread supply into the path of said gripper means of said shuttle, cutting means for cutting the inserted weft thread so as to sever an inserted portion thereof from a supply portion, holding means for holding the severed supply portion, releasing means for opening said gripper means so as to release the engaged weft thread, mounting means mounting said guide means, cutting means and holding means on said sley for common movement transverse to said track between a laterally retracted position and an operative position in which the guide means are located above the path of said shuttle on said track, and said cutting means and said holding means are located below said guide means for movement between an open position located in the path of movement of said shuttle, and a closed position located below the path of movement of said shuttle.

3,851,678

FILLING THREAD TRANSFER AND CLAMPING DEVICE

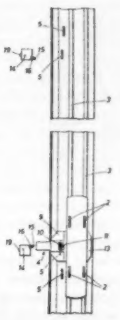
Walther Filter, Langenhagen, Germany, assignor to Vereinigte Osterreichische Eisen-Und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria and Etablissement Wanderfield & Co., Schaan, Liechtenstein

Filed Aug. 13, 1973, Ser. No. 387,722

Claims priority, application Austria, Aug. 18, 1972, 7141/72

Int. Cl. D03d *47/24*

U.S. Cl. 139—126 **4 Claims**



1. In a loom, the combination comprising

1. a carrying structure defining a shuttle race extending in a longitudinal direction,
2. a shuttle body carried by the structure on the shuttle race and movable therealong in the longitudinal direction,
   a. the shuttle body having a fell side,
3. a jaw clamp carried by the shuttle body and protruding laterally from the fell side thereof in a direction transverse to the longitudinal direction of the shuttle race,
   a. the jaw clamp being spring-biased to a closed position,
   4. an expanding member carried by the shuttle body and operable to cause the jaw clamp to be opened about a parting plane against the spring bias of the jaw clamp,
   a. the jaw clamp opening and closing in respect of the parting plane about an axis extending in the longitudinal direction of the shuttle race,
5. stops carried by the structure adjacent the shuttle race and engageable by the expanding member to operate the expanding member so as to cause the jaw clamp to be opened as the shuttle member moves along the shuttle race, and
6. two filling thread feed tubes spaced apart in the longitudinal direction of the shuttle race and laterally adjacent

thereto on the fell side of the shuttle body, each feed tube having

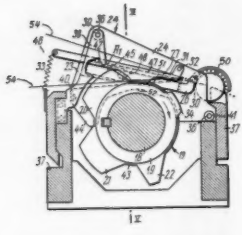
a. an outlet end with an axis extending in the parting plane of the jaw clamp and extending transversely to the longitudinal direction of the shuttle race, and

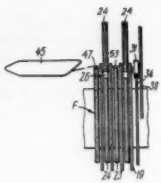
b. a tubular nozzle fitted on the outlet end and adapted to discharge a tubular air stream about the axis of the feed tube outlet end in a direction transverse to, and towards, the shuttle race, the tubular air stream being adapted to hold a filling thread portion protruding from the outlet end in a centered position in alignment with the parting plane of the jaw clamp when the same moves in an open position past the outlet end whereby the protruding filling thread portion is received in the open jaw clamp.

3,851,679
DEVICE FOR RETAINING THE END OF A WEFT THREAD IN LOOMS

Dmitry Vladimirovich Titov, 13 Parkovaya ulitsa, 27, korpus 2, kv. 49; Alexandr Aronovich Rotenburg, ulitsa Krupskoi, 3, kv. 19, and Leonid Mikhailovich Pevzner, 3 linia, 13, kv. 6, all of Moscow, U.S.S.R.

Filed Feb. 28, 1973, Ser. No. 336,714
Int. Cl. D03d *45/50, 47/00*
U.S. Cl. 139—194 **8 Claims**





1. A device for retaining the end of a weft thread in shuttleless looms including a reed with teeth for beating up the weft thread to the fell of the cloth being woven and a weft thread carrier, said device comprising: means for retaining the ends of the weft thread, said retaining means including two groups of contoured plates arranged at both sides of said reed; said plates having elongated portions received intermediate of said teeth of said reed, said plates further having cutouts and lugs; axes supporting said contoured plates in a spaced relationship; said two groups of said contoured plates being arranged so that said cutouts thereof define a channel for the passage of said weft thread carrier and said lugs of said said plates of one of said two groups being received intermediate of said lugs of said plates of the other of said two groups to partly overlap one another so that the respective ends of said weft thread will be bent in succession about said lugs.

3,851,680
MISSING PICK SENSOR

Fletcher A. Murray, West Columbia, S.C., assignor to Uniroyal, Inc., New York, N.Y.

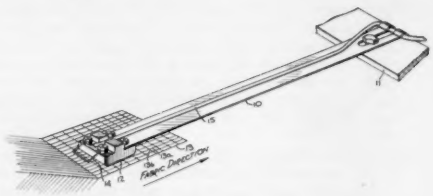
Filed Feb. 21, 1973, Ser. No. 334,499
Int. Cl. D03d *51/18, 51/34*
U.S. Cl. 139—348 **4 Claims**

1. In apparatus for stopping a loom for weaving fabric having wire warps when a pick is missing, a missing pick sensor comprising:

a resilient member attached to the loom;

a member of insulating material attached to said resilient member and bearing on woven fabric having wire warps during normal operation of the loom when no picks are missing from the fabric;

a conductive member supported by said insulating member and extending from said insulating member and positioned over the wire warps near the point of weaving a pick through the wire warps;

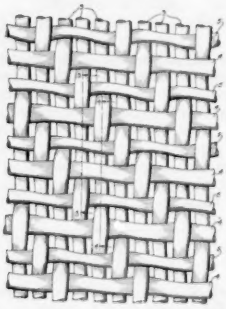


and circuit means for conductively coupling said conductive member to a loom stop-motion circuit, said conductive member being so positioned on said insulating member as to be out of contact with the wire warps when no picks are missing and to make contact with the wire warps when a pick is missing, the wire warps forming a portion of the loom stop-motion circuit.

3,851,681
WOVEN PAPERMAKING DRAINAGE FABRIC HAVING FOUR SHED WEAVE PATTERN AND WEFT THREADS OF ALTERNATING DIAMETER

Cleon J. Egan, Kaukauna, Wis., assignor to Albany International Corp., Appleton, Wis.

Filed Apr. 18, 1973, Ser. No. 352,320
Int. Cl. D21f *1/10*
U.S. Cl. 139—420 R **7 Claims**



1. In a Fourdrinier papermaking drainage fabric of interwoven warp and weft threads, the combination of:

a four shed weave pattern with both the warp threads and the weft threads passing around one of the other threads on one side of the fabric and then around three of the other threads on the opposite side of the fabric;

the warp threads being of substantially uniform diameter;

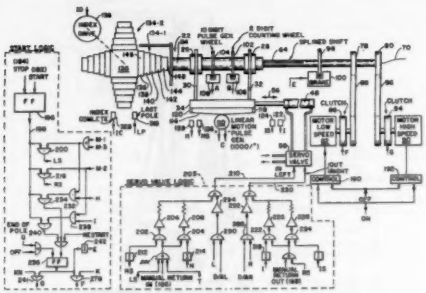
the weft threads being of an all synthetic material and alternating in diameter with every second thread being of a diameter larger than the alternate threads therebetween, the difference in weft thread diameters being at least 10 percent of the smaller weft thread diameter; and

crests of warp knuckles on the wear side of the fabric being receded within weft knuckle crests.

3,851,682
DIGITALLY CONTROLLED WINDING APPARATUS AND METHOD

Ralph A. Vogel, Three Rivers, Mich.; Donald L. Anderson, Fort Wayne, Ind.; Robert A. Chattin, Mundelein, and Joel L. Mosak, Glenview, both of Ill., assignors to Essex International Inc., Fort Wayne, Ind.

Filed June 4, 1973, Ser. No. 366,368
Int. Cl. B21f 3/04
U.S. Cl. 140—92.1 27 Claims



1. In apparatus for winding at least two concentric dynamoelectric machine field coils upon a coil form having at least two steps of progressively smaller size, said apparatus including:

flyer means mounted on a shaft for winding wire upon said steps to form said coils,

means for rotatably supporting said shaft,

first drive means for rotating said shaft and flyer means relative to said coil form,

and means for mounting said supporting means for linear movement parallel with the axis of said shaft,

the improvement comprising:

linear-acting fluid power drive means for moving said supporting means linearly on said mounting means thereby to traverse said flyer means with respect to said coil form,

a. first means for generating a first electrical signal having a first characteristic proportional to a predetermined incremental linear movement of said supporting means,

b. second means for generating a second electrical signal having a second characteristic proportional to a predetermined incremental angular movement of said shaft,

c. means for comparing said first and second characteristics and for generating an electrical error signal in response to a difference therein,

d. means for controlling the speed of one of said drive means in response to said error signal thereby to provide a predetermined pitch for said coils,

e. manually adjustable means for selectively varying the ratio of one of said first and second characteristics with respect to the respective incremental movement thereby to vary said pitch,

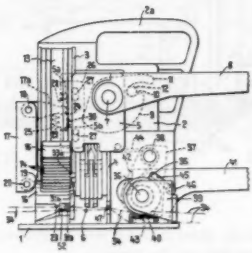
f. means for generating a third electrical signal having a third predetermined characteristic in response to completion of winding the first of said coils on the first of said coil form steps,

g. and means for applying said third signal to said comparing means for comparision of its characteristics with said first signal characteristic and generation of a second error signal in response to a difference therein, said controlling means (d) also controlling the speed of one of said drive means in response to said second error signal thereby to provide a connection having a predetermined pitch between said first coil and the second coil on the second one of said coil form steps.

3,851,683
SEALING DEVICE

Heinrich Glaus, Niederwangen, and David Jeanmaire, Hinterkappelen, both of Switzerland, assignors to Strapex AG, Wohlen, Aargau, Switzerland

Filed Jan. 12, 1973, Ser. No. 322,982
Claims priority, application Switzerland, Jan. 22, 1972, 902/72
Int. Cl. B21f 9/02
U.S. Cl. 140—93.4 12 Claims



1. Sealing device for applying seals to overlapping strips, comprising clamping means for securing the seals to the strips, a seal magazine disposed adjacent said clamping means to support a stacked array of seals, stripping means coupled with said seal magazine for inserting a seal from said stacked array into said clamping means, a common actuating lever for said clamping means and said stripping means, an actuating spring coacting with said stripping means to bias the same in a seal inserting direction, lost motion coupling means between said common actuating lever and said stripping means wherein said actuating lever displaces an open seal toward the strips during a first part of actuating motion and causes said clamping means to close the displaced seal about the strips during a second part of such actuating motion and wherein said stripping means is moved to a starting position for stripping off a new seal from said magazine at the end of said second part of said actuating motion when said displaced seal is completely closed, said actuating spring having a force sufficient for displacing a seal released from said magazine but insufficient for releasing a seal from said magazine, return movement of said actuating lever causing said lost motion coupling means to reach the end of its lost-motion stroke for positively actuating said stripping means to release a seal which is thereafter immediately shifted into said clamping means by said actuating spring.

3,851,684
METHOD AND APPARATUS FOR ASSEMBLING FLEXIBLE SHEET MATERIAL INTO FRAMES

Auvis Malvin Wyrick, P.O. Box 853, Magnolia, Ark. 71753

Filed May 9, 1973, Ser. No. 358,474
Int. Cl. B21f 33/00
U.S. Cl. 140—109 14 Claims

1. Apparatus for assembling flexible sheet material into a grooved frame comprising:

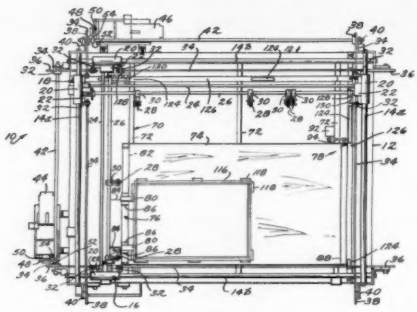
a support surface;

means to affix the frame to the surface and the sheet material over the frame and the grooves thereof;

a first carriage means having two rollers thereon;

means to move the first carriage means across the frame to roll the sheet material into the grooves on two sides of the frame;

a second carriage means having two rollers thereon; and means to move the second carriage means across the frame



to roll the sheet material into the grooves on the remaining two sides of the frame.

3,851,685

CONTINUOUS PRESS

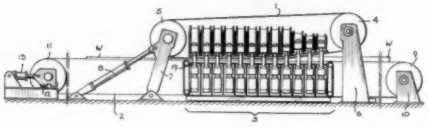
Karl-Heinz Ahrweiler, Krefeld; Valentin Appenzeller, Kempen/Ndrh; Kurt Quoos, Krefeld, and Eduard Kusters, Krefeld-Forstwald, all of Germany, assignors to Eduard Kusters Maschinenfabrik, Krefeld, Germany

Filed Nov. 21, 1972, Ser. No. 308,556

Claims priority, application Germany, Nov. 22, 1971, 2157746; Oct. 5, 1971, 2248760

Int. Cl. B27d *3/04*

U.S. Cl. 144—281 B **10 Claims**



1. An improved continuous press including endless loops formed by longitudinally and transversely flexible conveyor belts which form opposed, substantially linear spans defining a pressing zone, means for rotatively driving at least one of said loops to drive said spans in the same direction, press platens applying pressure through said traveling spans to work carried therebetween, and anti-friction means interposed between said platens and said spans; wherein the improvement comprises said anti-friction means being formed by a multiplicity of endless loops of rotatively unpowered roller chains forming a bed interposed between said platens and said belt spans, said roller chain spans being transversely packed together but each chain being individually free to travel independently with respect to the others and said belt spans.

3,851,686

METHOD AND APPARATUS FOR FELLING TREES

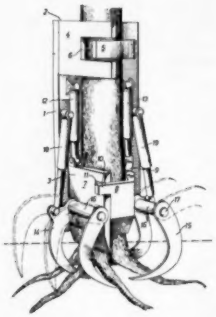
Gustaf Matteus Hultdin, and Ove Anders Hultdin, both of Mala, Sweden, assignors to Hultdins Verkstads AB, Mala, Sweden

Filed Dec. 14, 1973, Ser. No. 424,824

Claims priority, application Sweden, Jan. 12, 1973, 7300385

Int. Cl. A01q *23/08*

U.S. Cl. 144—309 AC **3 Claims**



1. A method of felling trees by separating the roots from the trunk of a tree so that said roots remain substantially in their original position under the ground, using an apparatus operated from a vehicle via crane or operating levers and comprising a frame joined to the operating levers, said frame being in the form of a substantially rectangular plate and a machining member having cutting means for cutting off said roots, said machining member being displaceable along the frame by means of force-transmitting means, the method being characterized by pressing a counter-member journalled in the frame down through the ground in the vicinity of the root section of the tree after the frame has been aligned with the trunk of the tree, so that said counter-member will be brought to engage from below in the ground with the root section or parts thereof, and forcing down said cutting means through existing roots to separate these from the trunk of the tree, against the action of said countermember beneath.

3,851,687

PENCIL SHARPENER

Marcellus Jones, 12989 Desmond St., Pacoima, Calif. 91331

Filed Oct. 15, 1973, Ser. No. 406,200

Int. Cl. B43l *23/06*

U.S. Cl. 145—3.1 **1 Claim**

1. An improved pencil sharpener for sharpening pencils or other instruments having various cross-sections, said sharpener comprising, in combination:

a container having a pair of upper and lower opposed, parallel panels and a pair of opposed, parallel side panels,

a first pin journalled in said side panels at the front thereof and adjacent to said upper panel,

a second pin journalled in said side panels at the front thereof and adjacent to said lower panels,

a first cutting blade pivotally secured by and rotatable about said first pin,

a second cutting blade pivotally secured by and rotatable about said second pin,

said first and second cutting blades having a cutting surface disposed on the end of each blade which is opposite the ends thereof secured to said pins,

said upper and lower panels having recesses therein on the sides facing the interior of the container,

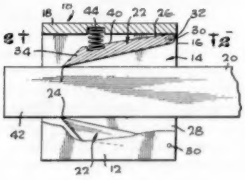
resilient biasing means disposed in each said recess adapted

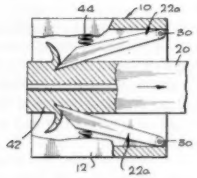
to contact the blade portion opposite said recess and to prevent rotation of said blades about said pins,

a recess formed in the first and second cutting blades,

said resilient biasing means consisting of a pair of coil springs,

said recesses in the upper and lower panels being round and





adapted to receive one end of the coil springs,

said recess in the cutting blades being round and adapted to receive the opposite end of the coil springs,

whereby said coil springs are locked in place to prevent lateral movement thereof, but to allow freedom of compression and expansion of the coil springs in response to insertion or removal of a pencil from the container.

3,851,688

CONTAINER OF FLEXIBLE MATERIAL

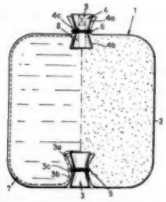
Jan Gerrit de Winter, Enschede, Netherlands, assignor to Nicolon N.V., Enschede, Netherlands

Filed June 27, 1972, Ser. No. 266,680

Claims priority, application Netherlands, June 28, 1971, 7108899

Int. Cl. B65d *33/16*

U.S. Cl. 150—8 **10 Claims**



1. A container or the like, comprising the combination of a tubular member of flexible material; a removable, elongated, rigid closure member for one end of said tubular member around which the flexible material can be gathered; and a retainer means with which said flexible material can be surrounded to secure said one end of said tubular member to said closure member, said retainer means engaging only said tubular member and said enclosure member having two frustoconical segments sloping inwardly to a juncture intermediate the ends of the closure member and being free of attachment to said tubular member whereby, with said one end of said tubular member secured to said closure member at said juncture by said retainer means, the exertion of a relative longitudinal force between said closure member and said tubular member tending to separate said members will displace said retainer means toward a larger diameter part of one of the frustoconical segments of the closure member, thereby increasing the resistance to separation of the closure member from said one end of said tubular member by wedging the flexible material with greater force between the closure member and the retainer means.

3,851,689

FOLDABLE SKI COVER

Richard S. Kohls, 415 1st North, Seattle, Wash. 98109

Filed Sept. 13, 1973, Ser. No. 396,691

Int. Cl. A45c *11/00*

U.S. Cl. 150—52 R **12 Claims**

1. A bag for carrying and storing a pair of skis therein, said bag being of a flexible, substantially waterproof material, comprising:

a. an elongated, generally tubular front portion having a closed front end for receiving the forward ends of a pair of skis;

b. an elongated, generally tubular rear portion for receiving the rear ends of said pair of skis, said rear portion being of greater cross-sectional area than said front portion, the rear of said rear portion being open for inserting said pair of skis therein;

c. an intermediate portion having a front end integral with said front portion and a rear end integral with said rear portion, the cross-sectional area of said intermediate portion increasing continuously from its front end to its rear end, said intermediate portion communicating with said front and rear portions to form a continuous, elongated bag, said bag being longer than said skis and said open end of said rear portion adapted to be folded on itself to close said bag;

d. a flexible partition in said bag extending longitudinally substantially the entire length of said bag dividing said bag into two compartments, each compartment adapted to receive one of said pair of skis; and

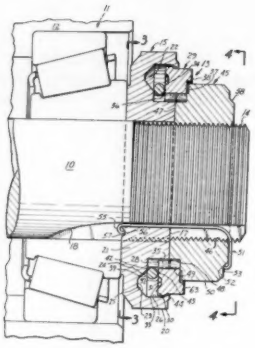
e. a plurality of separable fastening means distributed along the length of said bag for fastening said bag around said skis to hold said skis in position, at least one of said fas-

tening means disposed adjacent said open end of said rear portion.

3,851,690
MECHANISM FOR SECURING A NUT AGAINST LOOSENING

George S. Wing, Palos Verdes Estates, and Harry L. Bochman, Jr., Seal Beach, both of Calif., assignors to Hi-Shear Corporation, Torrance, Calif., by said Bochman, Jr.

Filed Sept. 24, 1973, Ser. No. 400,215
Int. Cl. F16b *39/02*
U.S. Cl. 151—8 **11 Claims**



1. Mechanism for locking a nut on a threaded spindle having a central longitudinal axis, comprising:

a washer having a hub portion adapted to fit over said spindle and a peripheral portion providing an annular recess having a base, between the peripheral and hub portions, and having a plurality of first serrations extending radially outward from said hub portion toward said peripheral portion;

means for keying said washer to said spindle so that the washer cannot rotate but can slide axially relative to said spindle;

an annular ring member at least partially within said annular recess providing an annular region between the annular ring member and the base of the annular recess, said ring member having a plurality of second serrations extending radially inward therefrom and matching and engaging said first serrations;

a resiliently strainable ring whose diameter can be enlarged and contracted, within said annular region;

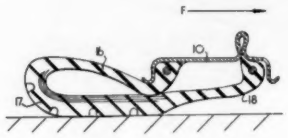
a threaded nut adapted to thread on the threaded spindle and to abut the washer, and containing a plurality of third serrations extending radially outward and adapted to engage said second serrations;

said annular recess having a side portion which slants in a direction away from the axis toward its base, and said resiliently strainable ring when unstrained being located at a position of said side portion remote from the base so that when pressure is applied to the annular ring member in the direction of the base of the recess, the annular ring member moves axially toward said base to disengage its serrations from the serrations of the nut, and at the same time the strainable ring is moved toward said base along said slanting side portion and its diameter is resiliently altered, whereupon the nut can be turned on the spindle, and when said pressure is released the strainable ring moves out of the base and pushes the annular ring member into a position where its serrations are in engagement with the nut serrations, thereby locking the nut.

3,851,691
PNEUMATIC TIRES

Tom French, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Filed Sept. 21, 1972, Ser. No. 290,814
Claims priority, application Great Britain, Sept. 29, 1971, 45306/71
Int. Cl. B60c *13/00*
U.S. Cl. 152—353 **12 Claims**



1. A pneumatic tire having an aspect ratio of less than 75 percent comprising bead portions, a braced tread portion having a substantially flat ground contacting surface and a pair of flexible sidewalls of mutually equal length extending between the bead portions and the tread portion; the tire, when mounted on a wheel rim and normally inflated having a cross section wherein:

1. the tread portion has a width greater than the distance between the bead heels in a ratio of at least 1.35 to 1;

2. the length of the sidewalls is such that the maximum internal section width of the tire occurs, at a distance measured radially, not greater than 40 percent of the total internal section height from the tread portion;

so that when the tire is deflated and subjected to a lateral force a restraint to lateral movement of the tread portion in relation to its wheel is caused by one sidewall being placed in tension between the tread contact patch and its bead and the other sidewall being folded between the edge of the tread portion and its bead, the lateral stiffness of the tread portion tending to resist any greater folding.

3,851,692
PNEUMATIC TIRES

Satoshi Takemura; Katsuyuki Harakon; Mitsuaki Maeda; Noboru Sakai, and Etsuko Hamano, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,169
Claims priority, application Japan, Dec. 29, 1972, 48-3221
Int. Cl. B60c *9/22*
U.S. Cl. 152—361 R **3 Claims**

1. Pneumatic tires reinforced with a carcass and a breaker and comprising a tread portion, a pair of side portions extending to both the shoulders of the tread portion and a pair of bead portions formed on each inner periphery of the side portions, characterized in that said carcass is composed of polyester fiber or 6,6-nylon fiber cord layer and said-breaker is composed of a layer wherein aromatic polyamide fiber cords having a tenacity of more than 10 g/d, an initial modulus of more than 150 g/d, and a twisting coefficient of cable twist of 0.10 – 0.60 and that of ply twist of 100 – 200 percent based on the cable twist, said twisting coefficient being represented by the following formula

$$NT = N \times \quad 0.139 \times D/\rho \times 10^{-3}$$

wherein NT represents the twisting coefficient, N is a twist number per 10 cm, D is one-half of total denier of cord and ρ is specific gravity of fiber, are embedded in parallel in a rubber having 300 percent modulus of 130 – 250 Kg/cm^2 and arranged in an angle of 5° – 38° against the circumferential direction.

3,851,693

RADIAL TIRE

Satoshi Takemura; Katsuyuki Harakon; Mitsuaki Maeda; Noboru Sakai, and Etsuko Hamano, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 18, 1973, Ser. No. 425,904
Claims priority, application Japan, Dec. 29, 1972, 47-3222
Int. Cl. B60c 9/22
U.S. Cl. 152—361 DM 3 Claims

1. A radial tire reinforced with a carcass having cords arranged in a direction perpendicular to the circumferential direction of the tire and with a breaker surrounding the carcass, and having a tread portion, a pair of side portions extending to both the shoulders of the tread portion and a pair of bead portions formed on each inner periphery of the side portions, characterized in that said breaker is composed of a composite layer consisting of a metal cord layer, in which steel cords are embedded in parallel in a rubber having a 300 percent modulus of 150 – 250 Kg/cm² at an angle of 5° – 25° against the circumferential direction of the tire, and a fiber cord layer, in which aromatic polyamide fiber cords having a tenacity of more than 10 g/d, an initial modulus of more than 150 g/d and a twisting coefficient of cable twist of 0.10 – 0.60 and that of ply twist of 100 – 200 percent based on the cable twist, said twisting coefficient being represented by the following formula:

$$NT = N \times \quad 0.139 \times D/\rho \times 10^{-3}$$

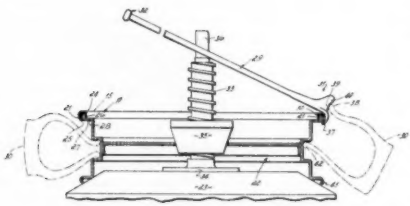
wherein NT is twisting coefficient, N is number of twists per 10 cm of the cord, D is one-half of total deniers of the cord and ρ is specific gravity of the fiber, are embedded in parallel in a rubber having a 300 percent modulus of 130 – 250 Kg/cm² at an angle of 0° – 45° against the circumferential direction of the tire.

3,851,694

WHEEL RIM PROTECTOR

William G. Brosene, Jr., Cincinnati, Ohio, assignor to Magnum Automotive Equipment, Inc., Cincinnati, Ohio

Filed Sept. 24, 1973, Ser. No. 400,389
Int. Cl. B60c 25/00
U.S. Cl. 157—1 4 Claims



1. A method of protecting a rim of a wheel during the mounting or demounting of a tire, including the steps of

slitting a length of generally toroidal shaped tubing longitudinally along its length from one end to the other, said tubing having spring characteristics that cause the opposed sides of said slit to grip said wheel's rim throughout substantially the entire length of said tubing after being seated on said wheel's rim, and

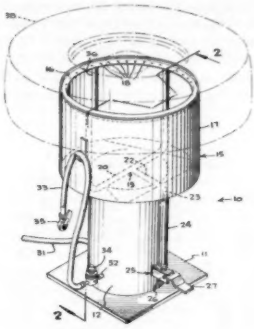
thereafter seating said tubing on said wheel's rim so as to protect said rim against scratching and marring from, as well as to provide a bearing surface for, a tire mount-/demount tool during rotation of that tool about the rim as the tire is mounted onto or demounted from said wheel.

3,851,695

TUBELESS TIRE BEAD SEATING MACHINE

Bobby G. Kimberly, Albertville, Ala., assignor to Bomar Manufacturing Company, Inc., Boaz, Ala.

Continuation of Ser. No. 228,708, Feb. 23, 1972, which is a continuation of Ser. No. 89,773, Nov. 13, 1970, abandoned.
This application Feb. 2, 1973, Ser. No. 328,946
Int. Cl. B60c 25/12
U.S. Cl. 157—1.1 10 Claims



1. A machine for pneumatically seating the beads of a tubeless tire on the flanges of a wheel on which the tire had been loosely mounted, comprising a stationary upright supporting stand including a cylindrical upper section defining an upwardly opening cylindrical well and a lower pedestal section for supporting the upper section at a selected elevation above a floor, the upper section being concentric with a vertical axis, said upper section including an air conduit in the form of a stationary ring tube arranged in a horizontal plane at the top of the upper section forming an annular support against which the lower side wall of a tire will rest and providing a circular center opening of sufficient diameter to pass the lower wheel flange of the associated wheel downwardly therethrough, the ring tube having a plurality of circumferentially spaced air outlet openings for directing air toward the region between the lower wheel flange and lower tire bead to be injected into the tire, said stand including means defining a stationary surge tank having means for connection to a source of pressurized air to store a quantity of air at a selected pressure, and a valve regulated surge supply conduit communicating the surge tank with said ring tube to supply a surge of high pressure air to said ring tube for discharge through said air outlet openings toward the space between the lower tire bead and lower wheel flange and into the tire resting on the ring tube to quickly bulge said lower bead into sealing relation with the wheel flange.

3,851,696

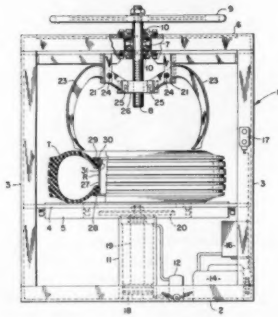
TIRE REMOVER

Eino Pihlaja, 101 Machar Ave., Thunder Bay P, Ontario, Canada

Filed June 12, 1973, Ser. No. 369,257
Int. Cl. B60c 25/08
U.S. Cl. 157—1.2 1 Claim

1. Apparatus for removing a truck tire from a rim having a fixed flange at one end adjacent one tire bead and a removable lock ring and flange at the other end adjacent the other tire bead, said apparatus comprising horizontal support means on which a tire and rim assembly is adapted to be supported with said lock ring and flange uppermost; a hydraulically actuated lifting member adapted when actuated upwardly through an opening in said support means to engage the lower end of said rim; an overhead support structure having a series of circumferentially spaced apart downwardly and inwardly curved

arms pivotally connected to said structure for movement of the lower ends thereof radially inwardly and outwardly along inclined paths corresponding generally with the inclination of the bead and adjacent sidewall portions of the tire; means on said structure for pivoting said arms to a position whereat the lower ends thereof overlie said removable flange whereby, upon upward actuation of said lifting member and rim engaged thereby, said lock ring is raised with respect to said removable flange and the top bead engaged with said flange to expose said lock ring for removal from said rim and for removal of said removable flange upon subsequent lowering of said lifting member; said tire and said rim without said locking ring and removable flange being adapted to be inverted on said support means for lifting of the rim and tire to a position whereat the integral flange is in the region of the lower ends of said arms so that said arms may be actuated inwardly to



wedge the lower ends thereof between said integral flange and the adjacent tire bead whereupon continued upward movement of the rim by said lifting member strips the rim from both beads of the tire, the space between successive arms enabling lateral removal of said rim from the apparatus; said lifting member, when subsequently lowered, passing through the beads of the tire supported by said support means and when said arms are swung outwardly to positions above the sidewall of the tire, said tire resting on said support means may be laterally removed from the apparatus; said arms having radially inwardly extending upper ends; and said means for pivoting said arms comprising an axially fixed screw rotatable in said structure, and a nut having screw-threaded engagement with said screw and a loose pivotal connection with said upper ends of said arms about pivots radially inward of the pivotal connections of said arms to said structure.

3,851,697

METHOD AND APPARATUS FOR FINISHING PNEUMATIC TIRES

Seiichiro Nishimura, Tokyo, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

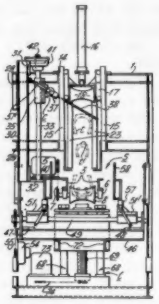
Filed May 30, 1972, Ser. No. 257,531

Claims priority, application Japan, June 7, 1971, 46-39277

Int. Cl. B29h *21/08*; **B23b** *3/22*

U.S. Cl. 157—13 **16 Claims**

1. An apparatus for finishing molded vulcanized pneumatic tires of the type having means for rotating a molded vulcanized rubber tire and at least three rollers supporting and contacting a tread surface of the tire, comprising a frame, a carriage movably mounted to said frame, a first comblike blade pivotally mounted on said carriage, first moving means to move said carriage mounted to said frame, said first moving means being adapted to vertically move said carriage so that siad first comblike blade is in contact with a tread surface of the tire in a plane including its vertical diameter and rotating axis of the tire, two side carriages movably mounted to said frame, positioned on each side of the tire, a second moving means to move said side carriages mounted to said frame, a



second comblike blade pivotally mounted on each of said side carriages, said second moving means adapted to move said side carriages toward and away from each other and vertically in unison so that said second comblike blades may contact the sides of the tire.

3,851,698

MANUFACTURE OF MULTI-FOLD YARNS

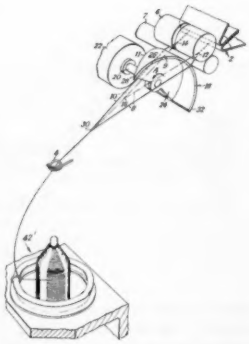
Roger Leach, Shaw; Neil Doggett, Shuttleworth, and James Lappage, Middleton nr. Manchester, all of, Middleton NE. Manchester, all of England, assignors to Platt International Limited, Oldham, Lancashire, England

Filed Jan. 11, 1973, Ser. No. 322,870

Claims priority, application Great Britain, Jan. 14, 1972, 1904/72

Int. Cl. D01h *13/02*, *1/02*

U.S. Cl. 57—91 **6 Claims**



1. Apparatus for spinning a multi-ply yarn comprising:

feed means for feeding two strands from spaced points in converging paths to a combining point,

twisting means downstream of the combining point for inserting twist into the combined strands which runs back to the combining point,

separating cam means having first and second camming edges and arranged between the feed means and the combining point,

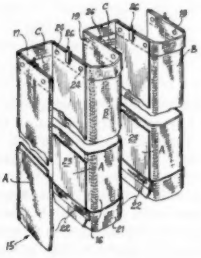
separating cam drive means for rotating said separating cam means whereby one edge of the separating cam means engages one of the converging strands and the other edge of the separating cam means engages the other of the converging strands to increase progressively the separation of the strands to a maximum separation whereupon the strands disengage from said camming edges and decrease in separation.

3,851,699

VERTICAL LOUVER TYPE WINDOW DRAPE

Harry Shapiro, 2534 S. Kedzie Avve., 2534 S. Kedzie Ave., Ill. 60623

Filed Jan. 26, 1973, Ser. No. 326,981
Int. Cl. E06b 9/26
U.S. Cl. 160—166 9 Claims



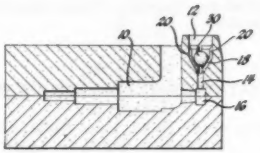
1. In combination with an apparatus for supporting and controlling the rotary and linear movement of a window covering including an elongated horizontal mounting member having a plurality of carriages movably supported thereon, each of said carriages having a rotatable depending supporting member and a vertical louver depending from each supporting member, first control means for effecting linear movement of said carriages and louvers longitudinally of said mounting member and second control means for effecting simultaneous rotary movement of each of said supporting members and louvers, each about a respective vertical axis, the improvement in said window covering which comprises a unitary flexible drape panel secured to said louvers at spaced intervals at least along the respective top edges thereof to provide alternate generally stiff and generally flexible panel sections with the planar surfaces of said drape panel and louvers being contiguous, said first and second control means being manually operable to selectively move said louvers to open light transmitting position wherein said generally stiff panel sections are arranged in parallel relation normal to the longitudinal axis of the mounting member and spaced from each other longitudinally of the mounting member, with the flexible panel sections between adjacent louvers being disposed alternately on opposite sides of the longitudinal axis of the mounting member in draped configuration, said first and second control means being operable to selectively move said louvers to closed light impeding position wherein said generally stiff panel sections are disposed in overlapping generally co-planar relationship and generally parallel to the longitudinal axis of the mounting member.

3,851,700

METHOD OF INOCULATING NODULAR CAST IRON

Donald A. McAfee, Defiance, and Thomas P. Newcomb, Wauseon, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1973, Ser. No. 389,482
Int. Cl. B22d 27/20
U.S. Cl. 164—57 7 Claims



1. A mold for inoculating molten nodular cast iron and immediately casting articles therefrom comprising

a mold including a mold cavity and a gating system communicating therewith,

said gating system including an open bottom pouring basin with the said bottom merging into a downwardly extending sprue passage of smaller cross-sectional dimensions at a throat-like region thereof,

a ball shaped inoculant insert having a greater dimension than said passage disposed in said region,

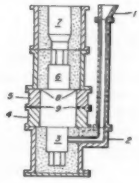
said region having a plurality of spaced radially inwardly extending projections supporting said ball insert and forming a plurality of passageways therebetween for conducting the molten metal from said pouring basin about said ball insert, to said passage and thence to said mold cavity.

3,851,701

GAS VENTING IN THE MANUFACTURE OF CHILLED ROLLS

George Souers, Mineral City, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 141,863, May 10, 1971, abandoned.
This application Nov. 30, 1972, Ser. No. 310,722
Int. Cl. B22d 15/00
U.S. Cl. 164—127 3 Claims



1. In the casting of iron base rolls wherein the molten metal which forms the roll body is poured through a gate set tangential to the periphery of the neck portion of the roll, said metal being poured rapidly to achieve a vigorous spin and thereby avoid steep thermal gradients in different parts of the roll, wherein said molten metal is contacted with a heavy-walled cast iron chill which serves to quickly cool said molten metal, thereby producing a uniformly hard roll surface containing a minimum of graphite, said chill comprising at least two separate, cylindrical, vertically aligned chiller sections, thereby resulting in the production and entrapment of gases which are deleterious to the production of a smooth roll surface, the

improvement which comprises, interposing discrete, removable spacer elements around the circumference of said roll body, between the horizontal interfaces of said chiller sections to effect a gap therebetween for effectively venting said deleterious gases; said gap being small enough to substantially prevent the ingress of molten metal, said spacer elements being of a dimension thicker than the desired gap opening and composed of a material which is sufficiently yieldable to provide the desired gap opening on being compressed during the set up of the mold.

3,851,702

CONDENSATION APPARATUS FOR STEAM TURBINE PLANTS

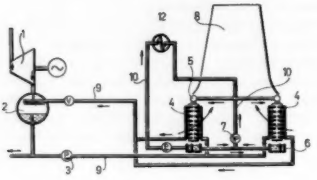
Laszlo Heller; Laszlo Forgo; Janos Bodas, all of Budapest, Hungary; I. A. Alekszejev, and G. Sz. Agejev, both of Moscow, U.S.S.R., assignors to Tyeploelektroprojekt, Moscow, U.S.S.R. and Energiagazdalkodasi Intezet, Budapest, Hungary

Filed Oct. 24, 1972, Ser. No. 299,976

Claims priority, application U.S.S.R., Oct. 25, 1971, 1710034

Int. Cl. F28b *3/04*; **F28d** *5/02*

U.S. Cl. 165—110 **4 Claims**



1. A condensation apparatus for a steam turbine station comprising, in combination, a mixing condenser, a first pipe conduit, surface heat exchangers connected with said mixing condenser by said first pipe conduit, air supply means for cooling said surface heat exchangers by means of air, a first circulation pump in said first pipe conduit for supplying condensate from said mixing condenser to said surface heat exchangers, vertically disposed ribs on said surface heat exchangers, individual water distributor spray means above said vertically disposed ribs consisting of a water distributor and sprinkler heads, a water collecting basin beneath said surface heat exchangers, a second pipe conduit for returning water from said surface heat exchangers to said mixing condenser, a second circulation pump, a third pipe conduit connecting said water collecting basin with the suction line of said second circulation pump the pressure line of which is connected to said water distributor spray means, cooler means for auxiliary equipment, a fourth pipe conduit having therein a third circulation pump for circulating water from said water-collecting basin to said cooler means, a common distributor conduit for distributing water from said cooler means to said water distributor spray means, individual control means provided at the connections between said individual water distributor spray means and said common distributor conduit for switching on and off a water flow to said water distributor spray means dependent on condensation temperatures and pressures prevailing in said mixing condenser, the ambient temperature and the load on said power station, said pipe conduits, circulating pumps, and water distributor spray means being sized and said control means being set to provide downwardly running water over said vertically disposed ribs in an amount sufficiently exceeding evaporation losses so that formation of scale on said ribs is avoided.

3,851,703

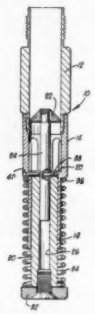
SAND DUMPING TOOL FOR DOWN HOLE DEPOSITION OF SAND IN OIL AND GAS WELLS

Billie J. Shirley, 12466 Trail Oak Dr., Oklahoma City, Okla. 73120

Filed Sept. 10, 1973, Ser. No. 395,506

Int. Cl. E21b *33/13*

U.S. Cl. 166—169 **11 Claims**



11. A sand dumping tool comprising:

tubular means having a bore extending therethrough, and including a tubular member having ports extending through the side thereof into communication with said bore intermediate its length;

valve means movably mounted in said bore and movable to a position above said ports for obstructing said bore to prevent the gravitating movement of particulate material through the bore in one direction to the location of the ports;

a plunger slidably mounted in the bore through said tubular means on the opposite side of said ports from said valve means;

spring means positioned between the tubular member and the plunger for resisting sliding movement of the plunger in the tubular means toward said valve means; and

breakable pin means retaining said valve means against movement in said bore and including:

frangible means temporarily interlocking said plunger with said tubular member to prevent relative movement therebetween.

3,851,704

METHOD FOR INSULATING A BOREHOLE

Orwin G. Maxson, and Gary D. Achenbach, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed June 28, 1973, Ser. No. 374,439

Int. Cl. E21b *33/13*, *43/00*

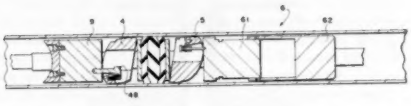
U.S. Cl. 166—292 **9 Claims**

1. A method for insulating a wellbore penetrating a subterranean region and having positioned therein an inner casing of a smaller diameter than the borehole by placing in the annular space between the wellbore and said inner casing an insulating material consisting essentially of a divided, solid, closed-cell material, having a particular size diameter in the range of 1 micron to 2 cm and at least 20 volume percent void space and at least one gas selected from the group consisting of the vapors of hydrocarbons having a boiling point below about 200°C, water vapor and air.

3,851,705
DUAL HYDRAULICALLY ACTUATED OIL WELL PACKER

Marion Barney Jett, Seagoville, and Dennis Mitchel Spriggs, Dallas, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 2, 1973, Ser. No. 412,386
Int. Cl. E21b *23/06, 33/122, 33/129*
U.S. Cl. 166—120 **19 Claims**



1. A dual string oil well packer comprising:

dual elongated tubular mandrels arranged in substantially parallel orientation, each having an integral independent bore passage extending therethrough;

upper body means attached to and encircling said mandrels;

unitary, tubular, pivotable anchor means located about said dual mandrels in encircling relationship and having a plurality of grooved teeth at opposing sides of said anchor means; said anchor means arranged on said mandrels in limited slidable and pivotable relationship whereby said anchor means can be rotated from casing engaging position to non-engaging position on said mandrels;

packer means comprising a plurality of resilient annular packer elements and rigid containing means adjacent said resilient elements, said packer means encircling said mandrels in a partially slidable relationship thereon and arranged to abut said anchor means;

hydraulic actuation means located on said mandrels and comprising piston means and cylinder means, said piston means slidably engaging said cylinder means, and said piston means and said cylinder means each containing inner annular differential pressure area surfaces arranged to communicate with port means through the wall of one of said mandrels; said differential pressure surfaces adapted to receive fluid pressure through said port means and force said piston means out of said cylinder means into abutment with said anchor means thereby rotating said anchor means and compressing said resilient packer elements into engagement with the well casing;

locking means on said mandrels for engaging said mandrel and maintaining said anchor means in said rotated position and said packer means in said compressed position; shear means preselectively shearable to allow said anchor means and said packer means to be released from said locking piston at a predetermined desired time; and,

releasing means in said packer arranged to abut said rotated engaged anchor means and selectively rotate said anchor means out of engagement with said well casing.

3,851,706
WELL PACKER AND RETRIEVER

Gary D. Ellis, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 307,696, Nov. 17, 1972, Pat. No. 3,818,987. This application Oct. 15, 1973, Ser. No. 406,764
Int. Cl. E21b *23/00*
U.S. Cl. 166—178 **1 Claim**

1. Release means for a well packer set in a casing with a hollow cylindrical mandrel extending through a resilient packer unit which is radially forced into contact with said casing by longitudinal compression between a drive cylinder secured to said mandrel below said packer unit wherein a hollow cylindrical grip having beveled generally parallel ends with toothed shoulders adjacent to opposite extremities of said beveled ends is tilted into wedging engagement with said casing by a force transmitted from said packer unit by a cylindrical spacer engaging the bottom of said grip which comprises:

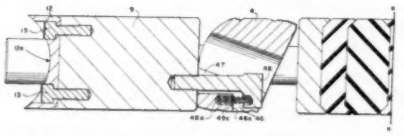
a. means to release said drive cylinder from said mandrel, and

b. structure including means on said mandrel to apply an upward force to the bottom of said grip at a location directly beneath the upper of said shoulders upon upward movement of said mandrel relative to said grip to release said grip.

3,851,707
UNI-DIRECTIONAL UNITARY ANCHOR SLIP

Marion Barney Jett, Seagoville, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 2, 1973, Ser. No. 412,239
Int. Cl. E21b *23/00*
U.S. Cl. 166—212 **7 Claims**



1. A unitary well tool anchor slip for ahchoring a well tool or well packer in the casing of an oil well, said slip comprising:

a generally cylindrical tubular member having a dual axis bore passage therethrough;

a plurality of gripping teeth having a curved boundary profile, said teeth being located on one side of said member near one end;

a second plurality of gripping teeth having a curved boundary profile, said second plurality of teeth located on the opposite side of said member near the opposite end;

an abutment shoulder located at one edge of one end of said member, said member end having a canted surface leading away from said abutment shoulder; and,

a compound abutment surface on the member end opposite said abutment shoulder, said compound surface having a flat surface extending from the central cylindrical axis to the edge of said member containing said gripping teeth and a radially curved surface extending from said central axis to the opposite edge of said member end.

3,851,708

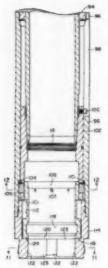
WELL PACKER AND RETRIEVER

Gary D. Ellis, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 307,696, Nov. 17, 1972, Pat. No. 3,818,987. This application Oct. 15, 1973, Ser. No. 406,763

Int. Cl. E21b *23/06*

U.S. Cl. 166—237 **8 Claims**



1. Release structure for a tool set in a well wherein a drive cylinder encircles the bottom of a hollow cylindrical mandrel and is locked to the well casing, which comprises:

a. a movable captured shear resistant element in recesses in the bottom of said tool to span a common boundary to said mandrel and said drive cylinder,

b. an insert cylinder supported by said mandrel having an outward facing peripheral groove dimensioned to accommodate said element and normally restrained with said groove positioned below said element to maintain capture of said element, and

c. structure supporting said insert cylinder from said drive cylinder having vertical internal ribs circumferentially arrayed below said insert cylinder and of internal diameter about the same as the internal diameter of said insert cylinder and separated by vertical recesses,

whereby hook means insertable down through said mandrel may engage the bottom of said insert cylinder only when aligned with said recesses to move said groove into registration with said shear resistant element thereby to release said mandrel from said drive cylinder.

3,851,709

HYDRAULIC FRACTURING METHOD TO CONTROL VERTICAL FRACTURE HEIGHTS

John L. Fitch; Lucien Masse; William L. Medlin, all of Dallas, Tex., and Maurice A. Biot, Brussels, Belgium, assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 21, 1973, Ser. No. 417,846

Int. Cl. E21b *43/26*

U.S. Cl. 166—308 **4 Claims**

1. A method of fracturing a subterranean formation that is located adjacent another formation having different mechanical characteristics, comprising the steps of:

a applying an initiation hydraulic pressure via said well to said subterranean formation to initiate in said subterranean formation a vertically disposed fracture;

b reducing said initiation pressure to a propagation pressure that is no greater than a predetermined pressure defined by the relationship

$$p_2 = s_o E/4a91-\nu^2) \qquad a_2G_2/a_1G_1$$

where:

p_2 = the predetermined propagation pressure which f not exceeded will limit the vertical extension of the fracture to the subterranean formation;

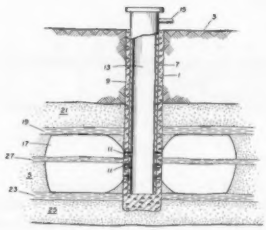
w_o = the maximum width of the fracture in the subterranean formation;

E = Young's modulus in the subterranean formation;

ν = Poisson's ration i the subterranean formation;

L = the thickness orlength in a vertical direction of the subterranean formation;

a = fracture surface energy; energy required to generate unit area of new surface by fracturing (subscript **1** refers to the subterranean formation, subscript **2** refers to the other formation).;



G = shear modulus (subscript **1** refers to the subterranean formation, subscript **2** refers to the another formation); and

c. applying said selected propagation pressure via said well to said subterranean formation to propagate said vertically disposed fracture into said subterranean formation.

3,851,710

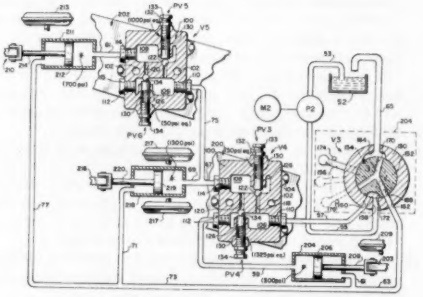
HYDRAULIC BEAMING CONTROL SYSTEM FOR PLOW IMPLEMENTS

William L. Grimm, Wheaton, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Sept. 19, 1973, Ser. No. 398,745

Int. Cl. A01b *3/00, 63/22*

U.S. Cl. 172—294 **10 Claims**



8. In a hydraulic control system for tractor-impelled farm equipment, in combination, a tractor, a farm implement operatively connected to the tractor in trailing relationship, said implement embodying vertically shiftable first and second frame portions, ground working tools carried by said frame portions and movable bodily therewith, said frame portions being movable between a normal lowered operative position wherein said tools carried thereby are in effective working engagement with the ground, and a raised inoperative transport position, a first wheel supporting said first frame portion and a second wheel supporting said second frame portion, said wheels assimilating at least a portion of the weight of the frame portions, a first power lift cylinder effective between the first wheel and first frame portion and operable when supplied

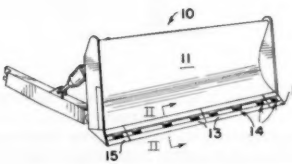
with fluid to raise the front end of the frame, a second power lift cylinder effective between the second wheel and second frame portion and operable when supplied with fluid to raise the rear end of the frame, said cylinders having power requirements commensurate with the weight distribution of said frame, a fluid pump, valve means having a fluid inlet connected to the discharge side of said pump, said valve means having a first fluid outlet connected to said first cylinder, and a second fluid outlet connected to said second cylinder, said valve means being automatically effective incident to the development of fluid pressure at said fluid inlet equal to the power requirement of the first cylinder to supply fluid to said first fluid outlet to the exclusion of the second fluid outlet and thus actuate the first cylinder for first frame portion raising purposes, and effective incident to the development of fluid pressure at said fluid inlet which is predeterminedly higher than the pressure requirement of the second cylinder to supply fluid to said second fluid outlet and thus actuate the second cylinder for second frame portion raising purposes, means in said valve means permitting fluid flow from said second outlet to said inlet only upon development of a predetermined pressure differential therebetween.

3,851,711

REPLACEABLE CUTTING EDGE

Visvaldis A. Stepe, Willow Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 29, 1973, Ser. No. 364,939
Int. Cl. A01b *39/22*
U.S. Cl. 172—681 **12 Claims**



1. An earthworking implement comprising
a support having a recess formed thereon,
a cutting edge mounted on said support, and
combined shear absorbing and attachment means detachably mounting said cutting edge on said support comprising
a separable shear absorbing member extending completely through said cutting edge and at least partially disposed in said recess and constructed and arranged for removal therefrom on the cutting edge side of said implement and fastening means releasably attaching said shear absorbing member and said cutting edge to said support and exposed on respective sides of said implement.

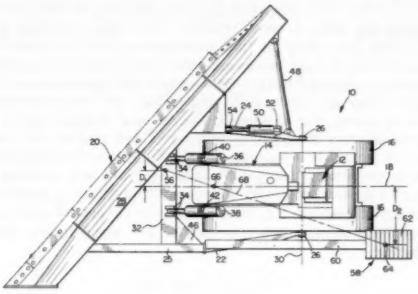
3,851,712

COUNTERWEIGHT ASSEMBLY FOR VEHICLE-MOUNTED IMPLEMENT

Robert J. Purcell, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 18, 1973, Ser. No. 324,660
Int. Cl. E02f *3/76*
U.S. Cl. 172—801 **2 Claims**

1. In a vehicle having a longitudinal axis and an implement assembly comprising a pair of push arms, means pivotally mounting the same on a transverse axis to the vehicle, said push arms being disposed on either side and extending forwardly of the vehicle, and an implement mounted to the forwardly extending ends of the push arms, said implement assembly having its center of gravity spaced from the longitudinal axis of the vehicle on one side of said longitudinal axis, the improvement which comprises counter weight means secured to said implement assembly on the other side of said longitudinal axis and rearwardly of said transverse axis of the vehicle,



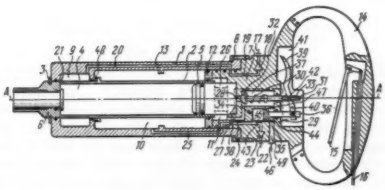
and defining with the implement assembly an implement-and-counter weight assembly the center of gravity of which is closer to said longitudinal axis of the vehicle than the center of gravity of the implement assembly alone.

3,851,713

SINGLE SHOT RIVERTING DEVICE

Igor Grigorievich Fedosenko, 602 mikroraion, 51, kv. 206; Vadim Grigorievich Kononenko, ulitsa Chkalova 15, kv. 12; Vladimir Semenovich Lepetjukha, 607 mikroraion 52, kv. 8, and Lev Petrovich Vasilchenko, ulitsa Volodarskogo, 57a, kv. 20, all of Kharkov, U.S.S.R.

Filed Apr. 20, 1973, Ser. No. 353,016
Claims priority, application U.S.S.R., Mar. 16, 1972, 1759257; June 20, 1972, 1795791
Int. Cl. B21j *15/22*
U.S. Cl. 173—121 **7 Claims**



1. A single-shot riveting device comprising: a housing; a hollow cylinder arrnged in said housing and having a cavity and two end faces; a striking means travelling in said cavity of said hollow cylinder for effecting clinching; a rivet set means adapted for upsetting rivet heads arranged at one end face of said hollow cylinder; ports made in said hollow cylinder in the vicinity of said rivet set means; a cavity made in said housing and connected with said cylinder cavity via said ports and with a compressed gas source for returning said striking means to its initial position; a hydropneumatic cylinder arranged in said housing and having a high-pressure compressed gas pneumatic portion adapted for storing the compressed gas energy and effecting a working stroke of said striking means, and a hydraulic portion communicating with said hollow cylinder cavity during the travel of said striking means; a floating piston separating said pneumatic and hydraulic portions of said housing hydropneumatic cylinder and moving in said housing hydropneumatic cylinder, whereby the compressed gas pressure in said housing hydropneumatic cylinder pneumatic por-

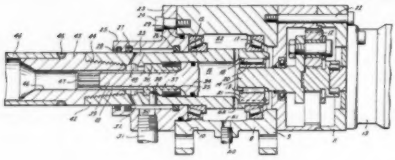
tion is increased for said storage of the compressed gas energy upon the fluid feed into said housing hydropneumatic cylinder hydraulic portion; a cover arranged at the other end face of said hollow cylinder and fixedly connected with said housing; a socket made in said cover at the side of said hollow cylinder, said socket receiving clearance-free the said striking means when the latter is being returned to its initial position and thereby preventing the fluid from flowing into the space between said striking means and said cover from said hydraulic portion when said fluid is fed thereto; a through hole made in said cover and connecting said socket with said hydraulic cavity during the working stroke of said striking means; a control valve mounted in said cover and shutting off said cover through hole when said fluid is fed into said port housing hydropneumatic cylinder hydraulic portion and opening it during the working stroke and returning said striking means to its initial position; a pressure main line connected with said hydraulic housing hydraulic portion for supplying the fluid thereto.

3,851,714

ROTARY DRILLING HEAD AND METHOD OF BREAKING PIPE JOINTS

Ronald C. Visser, and Vernon G. Steward, both of Houston, Tex., assignors to Mission Manufacturing Company, Houston, Tex.

Filed Dec. 26, 1973, Ser. No. 427,488
Int. Cl. E21b *19/16*
U.S. Cl. 173—164 **10 Claims**



1. A rotary driving head for a drill string comprising a casing, a drive spindle projecting therefrom, coupling means rotatable with said spindle for attachment to complementary coupling means on the end of a drill pipe, plunger means movable along said spindle, torque applying means on said plunger means for cooperating with complementary torque receiving means on the drill pipe coupling means, and means for shifting said plunger means between a retracted position clear of said coupling means and an advanced position projecting into said coupling means for locking said coupling means together.

3,851,715

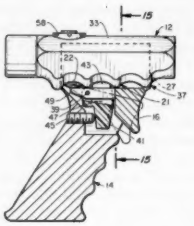
AIR OPERATED TOOL

John R. Hedrick, La Crescenta, Calif., assignor to Pevrick Engineering Co., Inc., Sun Valley, Calif.

Filed June 8, 1973, Ser. No. 368,213
Int. Cl. B23b *45/04*
U.S. Cl. 173—170 **6 Claims**

1. In combination with an air operated tool wherein said tool includes a motor unit, said motor unit to drive a tool attachment, said motor unit being mounted within a housing, said housing having a series of convolutions formed thereon, a handle grip assembly adapted to connect with said housing, said handle grip assembly comprising:

a handle grip housing, a securing block pivotally mounted by pivot means to said handle grip housing, securing



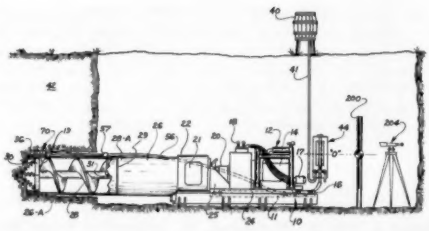
means mounted within said handle grip housing adapted to contact said securing block, said securing means being movable to cause pivoting movement of said securing block into tight engagement with one of said convolutions, thereby securing together said handle grip housing and said motor housing.

3,851,716

HORIZONTAL EARTH BORING MACHINE

Thomas W. Barnes, Franklin, Ohio, assignor to The Richmond Manufacturing Company, Ashland, Ohio

Filed Apr. 27, 1973, Ser. No. 354,998
Int. Cl. E21b *47/02*
U.S. Cl. 175—45 **16 Claims**



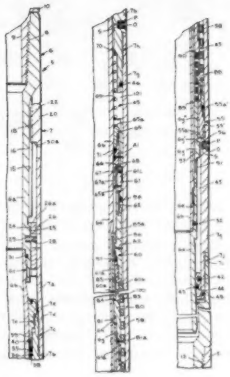
1. A remote grade indicating apparatus for tunneling, jacking and boring into earth fill in the construction of subterranean passages, said apparatus comprising, in combination, sensing means for progressive extension into the earth fill; gauge means for location adjacent the earth fill and connected to the sensing means, said gauge means including read-out indicia for informing the operator of grade deviations of the sensing means; and means forming a shoulder on the sensing means for temporary support of a sight target for zeroing the

gauge means with the sensing means at the outset of the progression into the earth fill.

3,851,717
SUBSTANTIALLY CONSTANT TIME DELAY FISHING JAR

William O. Berryman, Houston, Tex., assignor to Baker Oil Tools, Inc., Houston, Tex.

Filed Nov. 15, 1973, Ser. No. 416,197
Int. Cl. E21b *1/10*
U.S. Cl. 175—297 **46 Claims**



1. In a hydraulic fishing jar adapted to be run into a well on a fishing string and connected to a fish in the well bore:

a. inner and outer telescopically interengaged bodies;

b. means defining between said bodies a hydraulic fluid chamber;

c. power piston means in the chamber operable upon tensioning the fishing string for telescopic movement of said bodies to compress and apply a predetermined force to the hydraulic fluid in the chamber;

d. therebeing by-pass flow passage means in one of said bodies;

e. a valve member in the chamber for normally closing off one end of the by-pass flow passage means from the compressed fluid in the chamber and shiftable to open so that compressed hydraulic fluid is released to the by-pass flow passage means;

f. piston means including substantially constant flow by-pass means to transfer the compressed hydraulic fluid in the chamber across said piston means and thereby move it in the fluid chamber at substantially a constant rate to engage and move said valve member to open the by-pass flow passage means at one end to the compressed hydraulic fluid;

g. said piston means including valve means normally closing off the other end of the by-pass flow passage means and shiftable to open so that hydraulic fluid is released from the chamber above said piston means;

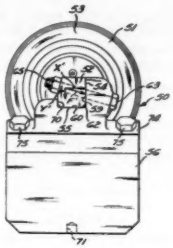
h. means on one of said bodies to move said piston valve means and open the other end of the by-pass flow passage means when said valve member is moved to open one end of the by-pass flow passage means to the compressed hydraulic fluid; and

i. hammer and anvil means on said bodies movable into engagement when said valve member and piston valve means open the by-pass passage means to the chamber across said piston means.

3,851,718
ROLLER CUTTER

Trevor Fink, University Heights, Ohio, assignor to Jarva, Inc., Solon, Ohio

Continuation-in-part of Ser. No. 304,955, Nov. 9, 1972, abandoned. This application Aug. 20, 1973, Ser. No. 390,012
Int. Cl. E21b *9/08;* **E21c** *13/00*
U.S. Cl. 175—363 **15 Claims**

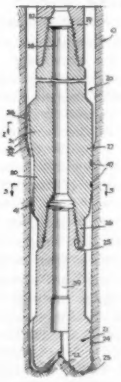


1. A roller cutter assembly comprising a cutter rotatably mounted on a shaft so that end portions of said shaft project from said cutter, said end portions having first and second flat angularly related faces, a generally U-shaped saddle having projecting arm portions mounting said shaft and a mounting face adapted to be secured to a cutter head, each projecting arm portion having first and second flat angularly related faces respectively engaging the first and second faces on each said end portion, means for clamping each arm to each end portion and for providing a clamping force between engaged faces having components normal to each face, said clamping means providing a greater force component parallel to said mounting face.

3,851,719
STABILIZED UNDER-DRILLING APPARATUS

Charles T. Thompson, Dallas, and Bobby J. Thompson, Garland, both of Tex., assignors to American Coldset Corporation, Dallas, Tex.

Filed Mar. 22, 1973, Ser. No. 344,051
Int. Cl. E21b *9/22*
U.S. Cl. 175—406 **11 Claims**



1. A rotary under-reaming device for enlarging a pilot hole of predetermined radius drilled in the earth, the device comprising:

an elongated cylindrical body having a radius no greater than the predetermined radius of the pilot hole and a threaded upper end for attachment to a drill pipe;

an asymmetrical reaming section extending outwardly from the upper part of the body about only an arcuate portion of the circumference thereof to a radius greater than the radius of the pilot hole, the arcuate portion subtending an angle of less than 180° and the remainder of said circumference having a non-reaming face, and

a first non-reaming stabilizing section located on the body below the reaming section, the stabilizing section having a smooth, non-cutting, bearing surface defined by a first cylinder concentric with the longitudinal axis of the cylindrical body and having a radius approximately equal to the predetermined radius of the pilot hole but having sufficient clearance to rotate in the pilot hole without binding, whereby the reaming section is caused to rotate concentrically with the axis of the pilot hole.

3,851,720

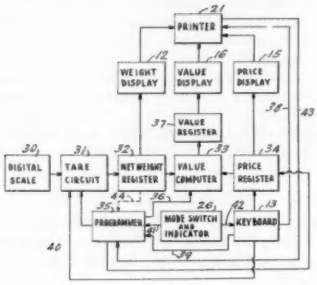
MULTIPLE MODE COMPUTING SCALE SYSTEM

Roger B. Williams, Jr., Sylvania, Ohio, assignor to Reliance Electric Company, Toledo, Ohio

Filed June 27, 1973, Ser. No. 373,908

Int. Cl. G01g *23/38*

U.S. Cl. 177—3 **3 Claims**



1. A system for weighing, computing and printing records of the weight and value of articles having retail sales and prepacking modes of operation and comprising, in combination, means for measuring the gross weight of the articles, means for storing a tare weight, means for calculating the net article weight from the measured weight and the stored tare weight, means for storing price information, computer means for computing the value of the weighed article from the net weight and the stored price information, means for supplying price per unit weight information to said price storing means, means for supplying price per fractional unit weight information to said price storing means, means for printing the net weight and the computed value for each weighed article, means for clearing said tare weight storage means and said price information storage means, switch means for selecting one or the other of said modes of operation and having a retail sales setting for enabling said clearing means for automatically clearing said tare weight storing means and said price information storing means after either each time a record is printed or each time a weighed article is removed from the system and having a pre-package setting for inhibiting said price per fractional unit weight supplying means and for inhibiting said clearing means from automatically clearing said tare weight storage means and said price information storage means, and indicator means separate from said switch means for indicating said pre-packaging mode of operation.

3,851,721

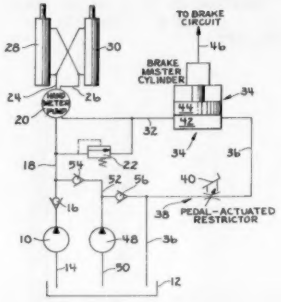
SUPPLEMENTAL FLUID SUPPLY

Glen S. Comer, Jr., Peoria; John R. Cryder, and John B. Waggoner, both of Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 29, 1973, Ser. No. 345,952

Int. Cl. B62d *5/04*

U.S. Cl. 180—79.2 R **3 Claims**



1. In a hydraulic fluid supply system for a vehicle control system having an engine driven pump normally providing fluid under pressure for operation of a hydraulic steering mechanism and a hydraulic braking mechanism, the improvement comprising:

said steering mechanism being upstream of said braking mechanism in said control system;

a wheel driven pump;

conduit means communicating said wheel driven pump to direct fluid under pressure into said supply system during forward operation only of said vehicle; and

anti-cavitation means including conduit means connected to the output of said wheel driven pump and communicating with sump and a pressure responsive check valve operative to permit circulation of said fluid through said wheel driven pump during reverse operation of said vehicle, whereby cavitation in said wheel driven pump is prevented.

3,851,722

CRASH RESPONSIVE MOTOR MOUNTING

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Feb. 23, 1973, Ser. No. 335,175

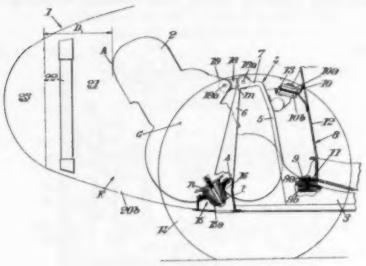
Claims priority, application France, Mar. 10, 1972, 72.08546

Int. Cl. B60r *21/02*; **B60k** *9/00*

U.S. Cl. 180—82 R **13 Claims**

1. An automobile vehicle, comprising in combination, a vehicle body, driving means, means for mounting said driving means, attachment means connecting said driving means in a forward part of the vehicle to said mounting means in front of the body, and means extending said forward part of the vehicle in front of the driving means and having sufficient mechanical strength so that on impact with an obstacle said extending means become deformed and thereby cause an increasing deceleration of the vehicle which reaches a critical value before the driving means comes into abutment against a sur-

face in front of it, said attachment means being adapted to be ruptured by the effect of the inertia of the driving means when



said critical value is reached, said rupture permitting the driving means to move forwardly relative to the body.

3,851,723

TRANSMISSION OVERHEATING ENGINE SHUTDOWN CONTROL FOR SELF PROPELLED VEHICLES

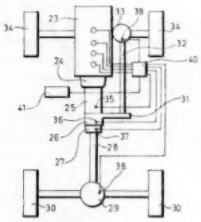
Brian Colin Pagdin, Sutton Coldfield, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed Feb. 15, 1973, Ser. No. 332,766

Claims priority, application Great Britain, Feb. 15, 1972, 6856/72

Int. Cl. B60k *21/06*

U.S. Cl. 180—103 **2 Claims**



1. A self-propelled, four-wheel drive vehicle including a prime mover; front and rear sets of driven wheels; transmission means between the prime mover and the driven wheels to transmit drive between the prime mover and the driven wheels, the transmission means comprising a change speed gear box driven by the prime mover, an inter-axle differential driven by said gear box, front and rear driving elements between said differential and said front and rear sets of driven wheels respectively and first control means including a casing with parts rotating therein to control relative rotation between parts of said differential; sensor means to sense the temperature of the first control means and second control means to prevent further operation of the prime mover when said temperature attains a predetermined value.

3,851,724

ACOUSTIC DAMPING STRUCTURES

Neill K. Banks, Jr., Gloucester, Mass., assignor to Bomco, Incorporated, Gloucester, Mass.

Filed Feb. 25, 1974, Ser. No. 445,538

Int. Cl. E04b *1/84*

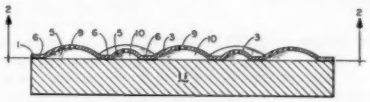
U.S. Cl. 181—33 G **10 Claims**

1. An acoustic damping structure consisting essentially of a lead sheet having

A. a lead content of at least 50 weight percent,

B. a thickness of between 0.007 and 0.100 inch, and

C. two major opposed surfaces; one of said major surfaces having a plurality of concavities therein, each concavity having an area of at least 0.01 inch², the sum of the areas



of said concavities being at least 30 percent of the area of the one major surface containing them and the number of concavities being sufficient to provide a population density thereof of at least 50 concavities per square foot of said one major surface.

3,851,725

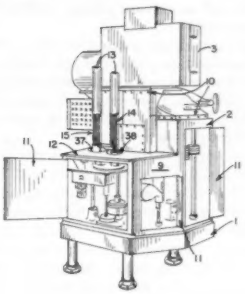
NOISE REDUCTION KIT FOR CAN CLOSING MACHINE

Albert C. Schnell, Hickory Hills; Craig W. Arends, Chicago Ridge, and Dean N. Zwikel, Chicago, all of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Sept. 17, 1973, Ser. No. 398,263

Int. Cl. F04b *1/99*

U.S. Cl. 181—33 K **7 Claims**



1. A sound proof enclosure having a sliding joint for containing sound emanating from a noise producing device comprising:

a lower continuous outer wall circumscribing said noise producing device extending upward over a portion of the overall height of said machine and having an upper edge; an upper separate outer wall circumscribing said noise producing device in the same fashion as said continuous lower wall and extending over some of the remaining portion of the overall height of said noise producing device and having a perimeter less than that of said lower continuous wall thereby forming a clearance gap between said lower and upper walls and enabling said upper wall to telescope within said lower wall;

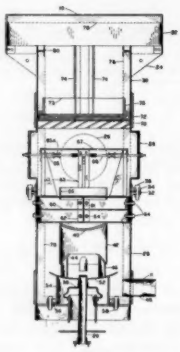
elongated resilient means mounted on the periphery of the upper edge of said lower continuous outer wall in such a manner as to occupy said clearance gap; and

at least one pressure plate extending parallel to said lower wall and lying adjacent to and pressing toward said resilient means whereby when said upper wall is engaged into said lower wall said upper wall forces apart said pressure plate from said resilient means whereby said pressure plate forces said upper wall to compress said resilient means forming an air tight and noise blocking seal between said upper and lower walls but still enabling said walls to telescope freely.

3,851,726
NOISE SUPPRESSOR

Ronald D. Grose, Omaha, Nebr., assignor to Northern Natural Gas Company, Omaha, Nebr.

Filed Apr. 16, 1974, Ser. No. 461,304
Int. Cl. F01m 1/10
U.S. Cl. 181—50 9 Claims



1. An apparatus for attenuating noises which result when fluid escapes through an exhaust passage at high velocity, said apparatus comprising:

a. an elongated cylindrical housing lined along its inside wall with a sound-insulating material and having an outlet at one end and an inlet at the other end, said inlet having a diameter substantially smaller than the inside diameter of said cylindrical housing and adaptable to be connected to a fluid exhaust passage;

b. an upstream impact baffle located within and attached to said cylindrical housing, and positioned between and spaced from said inlet and said outlet to deflect the flow of fluid entering said inlet, said baffle having a diameter smaller than the inside diameter of said cylindrical housing and greater than the diameter of said inlet;

c. a plurality of inclined vanes attached to and extending radially inwardly from said inside wall of said cylindrical housing such that fluid flow openings are defined between said vanes, said vanes positioned between and spaced from said upstream baffle and said outlet; and

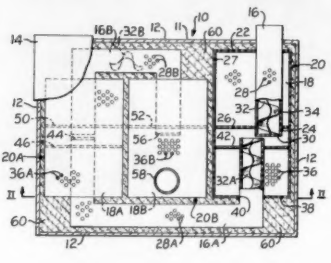
d. a fluid-permeable turbulence-dampening grid attached to and positioned across the entire inside cross-section of said cylindrical housing between said vanes and said outlet, said turbulence-dampening grid being located in close proximity to said vanes and spaced from said outlet.

3,851,727
MUFFLER WITH INSULATED INTERNAL SOUND DISPERSING AND ABSORBING CHAMBERS

Marvin G. Getz, Morton; Gerald E. Whitehurst, East Peoria, and Gerald M. Walden, Chillicothe, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 19, 1974, Ser. No. 462,450
Int. Cl. F01m 1/10
U.S. Cl. 181—50 12 Claims

1. In a muffler having a housing with an inlet and an outlet, a first chamber in said housing having perforations in the walls thereof, a conduit in said housing connecting said inlet with said chamber and having perforations in the wall thereof, baffle means in said conduit for diverting exhaust gases out through the perforations in said conduit, another chamber in said housing having perforations in the walls thereof and being operatively connected with the outlet in said housing, another conduit in said housing operatively connecting said another chamber with said first chamber, baffle means in said another conduit for diverting exhaust gases out through the perforations in said conduit, and insulating material surrounding said chambers and conduits within said housing, whereby said

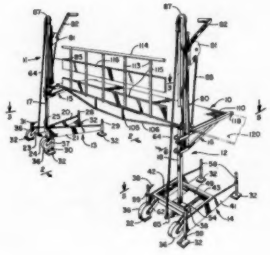


exhaust gases pass from chamber-to-chamber as the undesirable characteristics are substantially dispersed and dissipated into said insulating material prior to discharge from said muffler.

3,851,728
SCAFFOLD

Lowell A. Williams, Wimbledon, N. Dak. 58492

Filed Apr. 11, 1973, Ser. No. 349,975
Int. Cl. E04g 1/18
U.S. Cl. 182—17 7 Claims



1. A scaffold comprising:

a relatively long and narrow platform and first and second spaced upright supports for supporting opposite ends of said platform,

each of said supports comprising a base structure adapted to rest in stationary position upon a supporting surface, a vertical post supported by said base structure, a platform supporting member slidably supported for vertical movement on said post, and means for moving said platform supporting member vertically with respect to said post to different selected vertical positions,

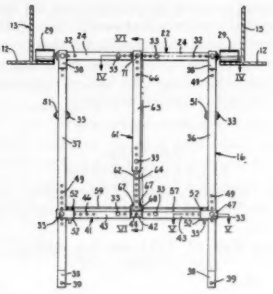
the base structure of the first of said supports having means for supporting its associated post and platform supporting member against lateral movement with respect thereto, and

the base structure of the second of said supports having means for supporting its associated post and platform supporting member for limited lateral movement with respect thereto parallel to the longitudinal axis of the scaffold to accomodate for changes in the horizontal distance between the lines of contact of said platform with said platform supporting members as the vertical position of one platform supporting member is changed with respect to that of the other.

3,851,729
SCAFFOLD STRUCTURE

Arnold Gordon, P.O. Box 81, RFD No. 2, Bangor Township, Van Buren County, Mich. 49013

Filed Oct. 4, 1973, Ser. No. 403,560
Int. Cl. E04g *3/10, 3/14*
U.S. Cl. 182—36 **10 Claims**

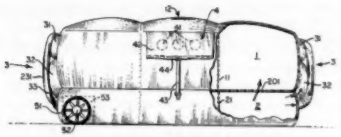


1. A scaffold structure adapted to be supported on and suspended from a pair of spaced overhead beams, comprising:
a pair of substantially parallel, elongated, telescopic axle means each having rollers on the opposite ends thereof adapted for rolling engagement with said overhead beams;
platform means supported from and suspended below said axle means, said platform means including a substantially horizontal platform adapted to support a workman or equipment thereon;
said platform means further including a pair of substantially parallel, elongated, telescopic cross-beam means, each of said support beam means being positioned substantially parallel to a respective one of said axle means and spaced downwardly therefrom by a substantial distance; and
connecting means for fixedly interconnecting each said cross-beam means to a respective axle means, said connecting means including vertically elongated post means having its upper end connected to said axle means, said post means also being connected to the respective cross-beam means at a location spaced downwardly a substantial distance from the upper end of said post means.

3,851,730
INFLATABLE SAFETY CUSHION SYSTEM FOR CONTROLLED DECELERATION FROM FALLS OF GREAT HEIGHT

John T. Scurlock, 6209 Schouest, Metairie, La. 70003

Filed Aug. 30, 1973, Ser. No. 393,016
Int. Cl. A62b *37/00*
U.S. Cl. 182—137 **20 Claims**

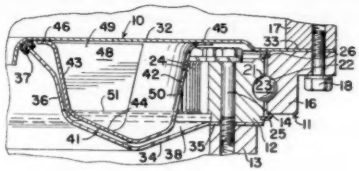


1. An air inflatable cushion for safety absorbing and decelerating the fall of a body falling from great heights comprising:
an inflatable section made of light flexible material defining a generally closed air system; and
air breather system means located in said section for allowing air to be rapidly exhausted from the interior of said section upon impact of a body falling onto said section, said breather system having a total cross-sectional area (A_B) when open and location (L_B) in at least general accordance with the following equations
$A_B = Vloss/0.6T_f \div Va$ and
$L_B = Va/2 \times T_1 + 2$ ft.
where
Vloss is the volume loss of said inflatable section during impact of the falling body;
Va is the velocity of air in said inflatable section;
T_f is the time elapsed from impact to full energy absorbtion of the falling body by said inflatable section; and
T_1 is the time necessary to build up to the maximum pressure to which one wishes to allow the falling body to be subjected to in being decelerated from the fall; making particular reference to the tables and equations herein; whereby the falling body is safely absorbed by impact upon the cushion; said breather system means properly releasing the built-up air pressure resulting from the impact.

3,851,731
LUBRICATION SYSTEM FOR GEAR DRIVE MECHANISMS

Stanley A. Jorgensen, Oswego, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 13, 1973, Ser. No. 350,680
Int. Cl. F01m *11/06*
U.S. Cl. 184—6.2 **8 Claims**



1. A horizontally disposed, annular enclosure enclosing a gear drive mechanism in an annular chamber thereof and lubricating means for communicating lubricating fluid to said gear drive mechanism and for maintaining a substantially uniform distribution of lubricating fluid circumferentially around said enclosure when said enclosure is tilted relative to its normal horizontal disposition, said lubricating means including an annular tray disposed in said annular chamber comprising contiguous sidewalls, a downwardly pointing bottom wall of generally V-shaped cross section and a plurality of circumferentially spaced plates disposed in said tray to extend radially inwardly between the sidewalls and said tray to divide the tray into a plurality of individual compartments.

3,851,732
MAST AND CARRIAGE FOR A LIFT TRUCK

Richard A. Wagner, Euclid; Paul A. Reid, Mentor; Edward G. Teutsch, Willoughby, and Milford D. McVeen, Highland, all of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Feb. 8, 1973, Ser. No. 330,890
Int. Cl. B66b *9/20*
U.S. Cl. 187—9 **19 Claims**

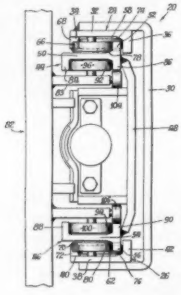
1. A mast assembly for a truck or the like, comprising:
first and second upright laterally spaced channel members each defining a base portion and forward and rearward parallel edge flange portion extending from said base portion and generally perpendicular thereto, with the

flange portions of each channel member disposed toward the other channel member;

first and second interconnected elongated members positioned inwardly of the first and second channel members respectively and movable therealong, the first elongated member defining a base portion and an edge flange portion extending from said base portion and generally perpendicular thereto, and disposed toward the first channel member and between the forward and rearward flange portions of the first channel member and adjacent the rearward flange portion thereof, the second elongated member defining a base portion and an edge flange portion disposed toward the second channel member and between the forward and rearward flange portions of the second channel member and adjacent the rearward flange portion thereof;

first and second bottom rollers mounted to the lower ends of the first and second elongated members respectively, the edge flange portions of the first and second elongated members defining cutout portions through which portions of the first and second bottom rollers respectively extend, with the first bottom roller positioned between the forward and rearward flange portions of the first channel member, with the rolling portions of the first bottom roller adjacent the forward and rearward flange portions of the first channel member, and further with the second bottom roller positioned between the forward and rearward flange portions of the second channel member, with the rolling portions of the second bottom roller adjacent the forward and rearward flange portions of the second channel member;

first and second top rollers mounted to the upper ends of the first and second channel members respectively, with the forward flange portions of the first and second channel members defining cutout portions through which



portions of the first and second top rollers respectively extend, with the rolling portion of the first top roller adjacent the edge flange portion of the first elongated member, and with the rolling portion of the second top roller adjacent the edge flange portion of the second elongated member;

a fork carriage comprising a frame and a pair of forwardly extending arms;

first and second rollers mounted to the fork carriage frame and rollingly associated with the first elongated member, with the axis of the second roller being below the axis of the first roller;

third and fourth rollers mounted to the fork carriage frame and rollingly associated with the second elongated member, with the axis of the fourth roller being below the axis of the third roller, allowing movement of the fork carriage along the elongated members upwardly and downwardly, meanwhile providing positive forward-and-rearward location of the fork carriage relative to the first and second elongated members;

a fifth roller mounted to fork carriage frame and positioned with its axis below the axis of the first roller and above the axis of the second roller; and,

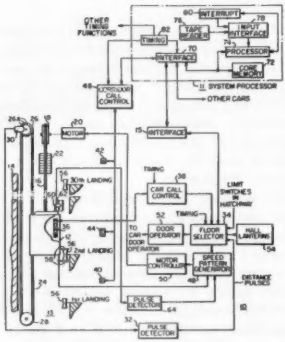
a sixth roller mounted to the fork carriage frame and positioned with its axis below the axis of the third roller and above the axis of the fourth roller, the fifth and sixth rollers being in contact with the rear portions of the first and second elongated member respectively inwardly of the first and second elongated members respectively, and a reinforcing member interconnecting the first and second elongated members rearwardly thereof, the fifth and sixth rollers passing closely adjacent thereto to minimize misalignment of said elongated members, to provide positive lateral location of the fork carriage relative to the first and second elongated members.

3,851,733

ELEVATOR SYSTEM

Milton Sackin, Pittsburgh, and David M. Edison, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 12, 1973, Ser. No. 340,617
Int. Cl. B66b 1/18
U.S. Cl. 187—29 R **30 Claims**



1. A method of allocating floor calls from a plurality of floors of a structure to a plurality of elevator cars mounted in the structure to serve the floors, comprising the steps of:

providing means for registering floor calls from the plurality of floors of the structure,

providing assignment means for each of the elevator cars,

processing a new floor call by adding the call to the assignment means of at least one of the elevator cars or by creating a demand signal,

reprocessing each floor call to locate the closest car in position to serve the call,

deleting a floor call added to the assignment means of a car during the processing step when the reprocessing step finds a different car which is closer to the call floor,

and adding the floor call to the assignment means of this closer car.

3,851,734

ELEVATOR SYSTEM

Milton Sackin, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 12, 1973, Ser. No. 340,615
Int. Cl. B66b 1/22
U.S. Cl. 187—29 R **21 Claims**

1. A method of allocating floor calls from a plurality of floors of a structure to a plurality of elevator cars mounted in

the structure to serve the floors, comprising the steps of:

providing call table means to which new floor calls are added and answered floor cals are deleted,

periodically ordering the floor calls in the call table means such that the floor calls appear in the call table means in the order in which their associated floors are located in the structure,

adding new floor calls received between ordering steps to an end of the ordered floor calls,

providing an assignment register for each of the elevator cars,

periodically processing only new floor calls located at the end of the ordered floor calls in the call table means by either allocating each new call to the assignment register of an elevator car which is in the process of serving a call for elevator service, or by creating a demand signal,

periodically assigning elevator cars which are not in the process of serving a call for elevator service to floor calls for which a demand signal was created,

processing all of the floor calls in the call table means following each ordering step, said processing step including the steps of:

determining for each call if it is in the assigneddemand category of (a) having had a demand signal created for it, and (b) in response to the demand signal an elevator car was assigned to the call,

verifying for an assigned-demand category call that an elevator car has been assigned to the floor associated with the call,

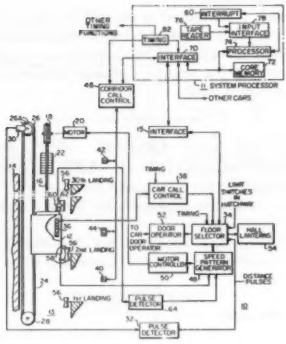
proceeding to the next call when the verification step affirms that a car has been assigned to the floor of the assigned-demand category call,

considering the assigned-demand category call unassigned when the verification step fails to affirm that a car has been assigned to the floor associated with the call,

processing an assigned-demand category call considered unassigned by either allocating the call to the assignment register of an elevator car which is in the process of serving an allocated call for elevator service, or by creating a demand signal,

considering floor calls not in the assigned-demand category as unassigned,

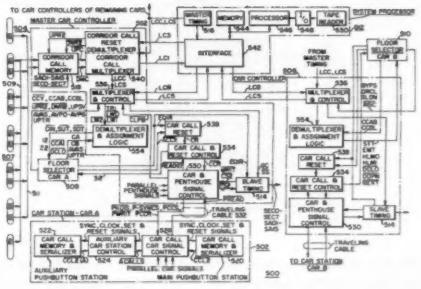
and processing each of these floor calls considered unassigned by either allocating the call to the assignment register of an elevator car which is in the process of serving a call for elevator service, or by creating a demand signal.



3,851,735
ELEVATOR SYSTEM

Charles L. Winkler, and Alan F. Mandel, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 12, 1973, Ser. No. 340,614
Int. Cl. B66b *3/00*
U.S. Cl. 187—29 R **18 Claims**



1. An elevator system, comprising:

a structure having a plurality of landings,

at least one elevator car mounted for movement relative to said structure to serve the landings,

said at least one elevator car including first control means disposed in the elevator car, second control means disposed at a point remote from the elevator car, and first data link means interconnecting said first and second control means,

said first control means including means providing data for said second control means, means storing said data, and first multiplexing means, said first multiplexing means time multiplexing said stored data to said second control means over said first data link means at a first predetermined rate.

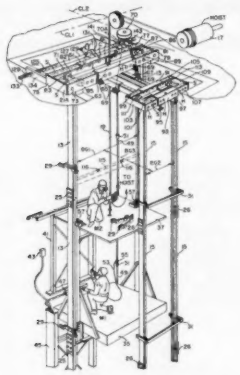
3,851,736
APPARATUS AND METHOD FOR INSTALLING ELEVATOR HOISTWAY EQUIPMENT

William A. Westlake, Allison Park, Pa., and Joseph A. Brizzolara, Union, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 20, 1973, Ser. No. 343,069
Int. Cl. B66b *7/02*
U.S. Cl. 187—95 **17 Claims**

1. A rig for installing elevator guide rails comprising a first guide rail support for supporting a first guide rail in substantially vertical position, a second guide rail support for supporting a second guide rail in substantially vertical position, and a mounting structure mounting said supports for adjustments substantially parallel to a plane, said mounting structure including hoist connection means for attachment to hoist rope means, said hoist connection means being constructed for maintaining said plane substantially horizontal when the hoist connection is attached to vertical hoist rope means, whereby

said supports may be utilized to support two vertical guide rails in predetermined horizontally spaced positions, and hoist



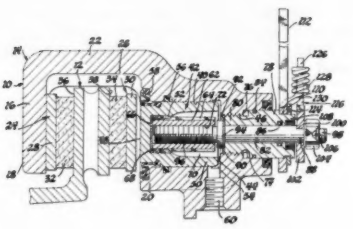
means connected to said hoist connection means for raising and lowering the mounting structure in substantially vertical directions.

3,851,737

DISC BRAKE WITH AUTOMATIC ADJUSTING PARKING BRAKE

James A. Hewins, Fraser, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 4, 1974, Ser. No. 447,732
Int. Cl. F16d *65/56*
U.S. Cl. 188—71.9 **2 Claims**



1. A disc brake comprising:

a caliper having a housing, brake shoes mounted therein for braking engagement with a disc, and a piston for hydraulically actuating the brake, said piston being mounted for axial movement in a cylinder formed in said housing;

a mechanically actuated brake apply shaft having a bore extending axially therethrough, said shaft extending into said cylinder coaxially with said piston and threadedly engaging said housing for rotational movement and consequent axial movements in brake apply and release directions;

an adjuster shaft rotatably mounted in said apply shaft bore and having a land engaging one end of said apply shaft so as to be moved axially therewith and thereby in the brake applying direction of movement of said apply shaft, one end of said adjuster shaft being threaded with a lesser thread pitch than and of the same hand as the threads threadably joining said apply shaft and caliper housing;

an adjuster nut splined to said piston so as to be limited to axial movement relative to said piston, said nut also threadedly engaging the threaded end of said adjuster shaft, one end of said nut being axially engageable with said piston in force transmitting relation to limit brake releasing movement of said piston and to apply brake actuating force thereto when said apply shaft is mechanically actuated to move said apply shaft and said adjuster shaft and said adjuster nut axially in the brake apply direction;

an actuating lever on said brake apply shaft for rotating said apply shaft by arcuate movement of said actuating lever within a predetermined arcuate stroke angular range;

a ratchet wheel on said adjuster shaft having a plurality of teeth thereon circumferentially equally spaced apart at angles therebetween substantially equal to and no greater than the angle of said actuating lever arcuate stroke angular range;

a spring loaded pawl pivotally mounted on said actuating lever and riding on said ratchet wheel and, upon arcuate movement of said actuating lever through an angle equal to the angle between adjacent of said ratchet wheel teeth in the brake apply direction, engaging one wheel tooth so as to rotate said ratchet wheel an angular distance substantially equal to said angular range upon return movement of said actuating lever to the brake release position, thereby rotating said adjuster shaft and causing said adjuster nut to move axially in the brake apply direction to adjust the brake;

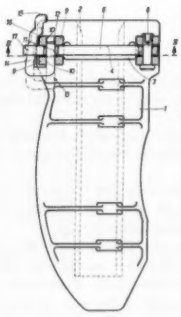
and a latch pawl mounted on said housing and yieldingly engaging said ratchet wheel to prevent rotation thereof in the other direction of rotation for an angular distance greater than the angular distance between two adjacent ratchet wheel teeth.

3,851,738

BRAKE SHOE FOR RAILWAY VEHICLE DISK BRAKES

Hans Gebhardt; Franz Prahl, and Mathias Schorwerth, all of Munich, Germany, assignors to Knorr-Bremse GmbH, Muenchen, Germany

Filed Mar. 19, 1973, Ser. No. 342,476
Claims priority, application Germany, Mar. 17, 1972, 2213049
Int. Cl. F16d *65/04*
U.S. Cl. 188—244 **10 Claims**



1. In a lock for a brake lining that can be inserted into a brake lining support of a disk brake for a railway vehicle, the combination of brake lining support means including longitudinally extending lining guide means on a face thereof, there being an opening in said lining supporting means extending transversely to said lining guide means, a latch having a first and a second end portion, said latch being pivotally mounted at the first end portion thereof on said lining supporting means

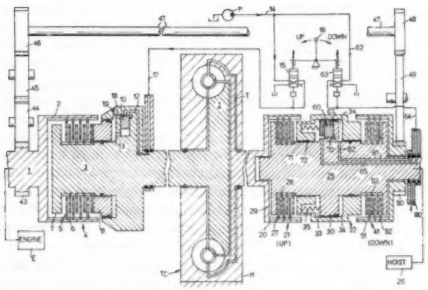
and pivotable into a locking latch position and in a plane perpendicular to the plane of the lining support means, a locking projection on said latch comprising an elongated extension of trapezoidal shape insertable into said opening, the entire length of said locking projection contacting a face of said opening away from said lining guide means when the locking projection is positioned in said opening to traverse said lining guide means, and locking lug means receiving the second end portion of the latch in the locking position of the latch.

3,851,739

HOIST REVERSING TRANSMISSION WITH CENTRIFUGAL SPEED CONTROL

Kurt A. Schneider; Leonard H. Adams, both of Rockford, and Conrad R. Hilpert, Winnebago, all of Ill., assignors to Twin Disc, Incorporated, Racine, Wis.

Filed Sept. 4, 1973, Ser. No. 394,057
Int. Cl. F16h *5/36*
U.S. Cl. 192—3.57 **2 Claims**



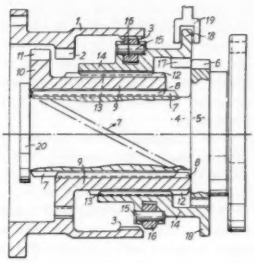
1. A power transmission and control system for raising and lowering hoist mechanism comprising, a power source, a torque converter connected to said power source and driven thereby, a modulatable friction type input clutch disengagably connected between said power source and said torque converter, centrifugally actuated hydraulic valve means connected with said modulatable clutch for regulating the output speed of said clutch and the input speed of said torque converter, a modulatable friction type "up" clutch connected to said torque converter for being driven thereby and also being connected to a hoist mechanism driving shaft for driving said hoist mechanism in a load raising position when said "up" clutch is engaged, a modulatable friction type "down" clutch connected to said hoist mmechanism driving shaft, power transmitting means connected between said power source and said friction type "down" clutch, and centrifugally actuated hydraulic valve means connected to said "up" and "down" clutches for causing selective engagement of said "up" clutch or said "down" clutch whereby when said "up" clutch is disengaged and said "down" clutch is engaged, said power transmitting means transmits power from said power source through said "down" clutch and to said hoist mechanism to drive the latter positively in a load lowering direction and to automatically release said "down" clutch and engage said "up" clutch during overspeed of said hoist mechanism, and control means for regulating both of said centrifugally actuated hydraulic valve means.

3,851,740

SYNCHRONOUS SELF-SHIFTING TOOTHED CLUTCH

Robert Howard Heybourne, 26 Ennismore Gdns., East Molesey, Surrey, England

Filed July 9, 1973, Ser. No. 377,755
Claims priority, application Great Britain, July 10, 1972, 32242/72
Int. Cl. F16d *23/10*
U.S. Cl. 192—67 A **3 Claims**



1. A synchronous self-shifting toothed clutch of the type including first and second rotary clutch members, coacting clutch teeth, and clutch actuating means including an intermediate member constrained for movement relative to said second rotary clutch members to effect at leas partial interengagement of said coacting clutch teeth, with pawl and ratchet mechanism for initiating the said movement of the intermediate member upon passage of said first and second rotary clutch members through synchronism in one direction of relative rotation, said pawl and ratchet mechanism including a first element comprising pawls and a second element comprising ratchet teeth, wherein the improvement comprises an auxiliary part, means mounting one of the said elements of the pawl and ratchet mechanism on said auxiliary part, and splines connecting said auxiliary part to one of said intermediate and first rotary clutch members whereby to enable said auxiliary part, with the clutch in a disengaged condition, to be shifted to move said one element of the pawl and ratchet mechanism axially away from the other of said elements to establish a pawl-free conditon of the clutch.

3,851,741

FLUID ACTUATED CLUTCH ASSEMBLY

Eisuke Sugahara; Yusaku Yagi, both of Tokyo, and Akihito Owada, Warabi, all of Japan, assignors to Nippon Piston Ring Co. Ltd., Tokyo, Japan

Filed Dec. 28, 1973, Ser. No. 429,440
Claims priority, application Japan, Dec. 28, 1972, 47-2381
Int. Cl. F16d *25/00, 25/04*
U.S. Cl. 192—85 R **5 Claims**

1. A fluid actuated clutch assembly comprising:

a. a rotary structure of substantially annular shape rigidly secured to a shaft for rotation therewith, said rotary structure having a radially extneding flange part and a boss part, said boss part being provided with radially outer and inner annular recesses formed on one end face thereof,

b. a stationary structure of substantially annular shape supported by a pillow block, axially facing said rotary structure, and located independently of said rotary structure to leave an axial space therebetween for allowing relative rotation of said rotary structure, said stationary structure being provided with radially outer and inner annular grooves formed on an end face thereof, opposite to said one end face of said rotary structure and opening in longitudinal direction thereof,

c. an inflatable friction member fixedly attached said flange

part of said rotary structure,

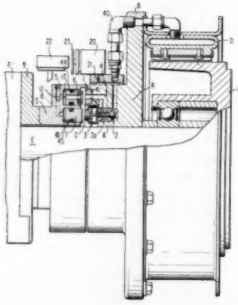
d. a relative annular sealing ring fixedly inserted into said radially outer annular recess of said rotary structure, said sealing ring being provided with a plurality of axial fluid passages,

e. a plurality of communication passages formed in said rotary structure, each one having one end open into a respective fluid passage of said sealing ring and the other end being fluid connected to said inflatable friction member,

f. a plurality of one-way valve devices, each provided in a respective communication passage and having a valve member slidably provided therein and biased into its first, closed position for preventing counterflow of a working fluid under pressure in the respective communication passages from said inflatable friction member during the clutch operation of said inflatable friction member, by means of a spring,

g. a plurality of actuating piston devices, each having a cylinder and a piston and mounted within said radially inner annular recess of said rotary structure, substantially in alignment with the respective one-way valve devices, said piston being slidable within said cylinder in an axial direction and biased away from said one-way valve device by said valve member with its outer end protruding into said space,

h. a substantially annular sealing piston slidably and hermetically carried within said radially outer annular groove of said stationary structure in a manner to form a substantially annular fluid chamber, which communicates with a fluid source, between the inner end face thereof and the



inner wall of said groove, said sealing piston having a plurality of axial fluid passages and having an annular sealingly, sliding element mounted within its outer end face thereof, said sliding element being provided with a plurality of axial fluid passages, each being substantially in alignment with the respective fluid passage of said sealing piston, said sliding element being provided with an annular fluid accumulative groove, which communicates circumferentially with all of said holes of said sliding element, at the outer side end face thereof,

i. a substantially annular discharging piston slidably and hermetically carried by said radially inner annular groove of said stationary structure in a manner to form a substantially annular fluid chamber communicating with the fluid source, between the inner end face thereof and the inner wall of said groove, and

j. means for selectively supplying the working fluid to said sealing and discharging pistons in accordance with a predetermined sequence; wherein said sealing piston is biased away from the inner side wall of said radially outer groove, upon application of a fluid pressure thereto for bringing said sliding element thereof into sealing contact with said sealing ring so that the working fluid is supplied to said inflatable friction member, and wherein said discharging piston is biased away from the inner side wall of said radially inner annular groove, upon application of a fluid pressure thereto, for bringing the outer end face thereof into abutting engagement with said protruding end of said actuating piston, consequently moving said piston and said valve member into its second, open position so that said communication passage is opened.

3,851,742

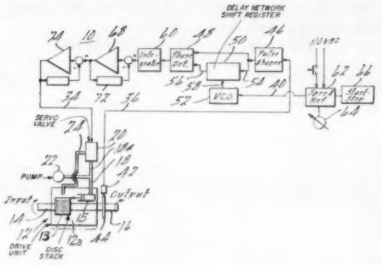
CONTROL SYSTEM FOR VARIABLE SPEED DRIVE

Gordon M. Sommer, Grosse Pointe, Mich.; Alfred C. Williams, Glenview, and Donald C. Carlson, Des Plaines, both of Ill., assignors to G. M. Sommer Co. Inc., Detroit, Mich.

Filed Sept. 22, 1972, Ser. No. 291,218

Int. Cl. F16d *43/284*; **F16k** *31/06*; **H03k** *5/20*

U.S. Cl. 192—103 F **28 Claims**



1. A system for adjusting the rotational speed of a rotatable member to approach a desired rotational speed comprising:

sensing means associated with said member for providing a sensing means train of pulses, each pulse of said sensing means train of pulses being representative of a predetermined increment of rotation of said member;

delay means receiving said sensing means train of pulses as an input thereof and providing a delay means train of output pulses as an output thereof;

speed reference means for providing a speed reference signal representative of the desired rotational speed of said member and for supplying said speed reference signal to said delay means;

said delay means comprising means for causing each pulse of said delay means train of pulses to be delayed correlative to a corresponding pulse received from said sensing means for a delay period whose duration is inversely proportional to the desired rotational speed of said member over a range of desired rotational speeds;

comparing means receiving said sensing means train of pulses and said delay means train of pulses for providing an output signal representative of the time interval between the receipt of respective pairs of said pulses of said delay means train of pulses and said sensing means train of pulses, each of said respective pair of said pulses of said delay means train of pulses and of said sensing means train of pulses including one pulse of said delay means train of pulses and a pulse of said sensing means train of pulses which is subsequent to that pulse of said sensing means train of pulses to which one pulse of said delay means train of pulses corresponds; and

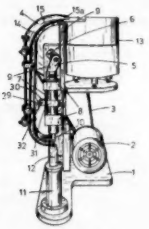
speed control means associated with said rotatable member for receiving said output signal of said comparing means and for controlling the rotational speed of said rotatable member in accordance with said output signal of said comparing means to cause the actual rotational speed of said rotatable member to approach its desired rotational speed.

3,851,743

UNIVERSAL CHARGING DEVICE FOR THE INSERTION OF EYELETS, RIVETS, HOOKS AND SIMILAR BY RIVETTING MACHINES

Bocca Alberto, and Pagani Mario, both of Via Farini, 43 Vigevano, Italy

Filed Feb. 29, 1972, Ser. No. 230,392
Claims priority, application Italy, Mar. 4, 1971, 21328/71
Int. Cl. B65g *11/00*
U.S. Cl. 193—2 C **7 Claims**



1. A device for feeding eyelets and the like of diverse sizes comprising: two elongated guide members each having at least one straight edge wherein the two straight edges are spaced apart to define a longitudinal slot therebetween receptive at one end thereof of eyelets for passage therethrough to the other end thereof; means for adjustably aligning the two straight edges relatively transversely about the median longitudinal axis of said slot to obtain a substantially constant width for said slot along the whole length thereof; and means for simultaneously adjusting the position of said two straight edges symmetrically with respect to said median longitudinal axis to variably adjust the overall constant width of said slot and to simultaneously maintain the position of said median longitudinal axis comprising an elongated rotatable rod having one threaded end portion having a left handed thread and another threaded end portion having a right handed thread, means mounting said rod to said two guide members for rotation about its longitudinal axis and disposing its longitudinal axis parallel to said median longitudinal axis, first means receptive of said one threaded end portion of said rod and coactive with one portion of both of said two guide members for effecting symmetrical movement about said median longitudinal axis of said one portion of both said guide members in response to rotation of said rod, and second means receptive of said another threaded end portion of said rod and coactive with another portion of both of said two guide members and responsive to the rotation of said rod for effecting symmetrical movement about said median longitudinal axis of said another portion of said two guide members simultaneously with and identical to the movement of said one portion of said guide members to impact a constant overall width to said slot.

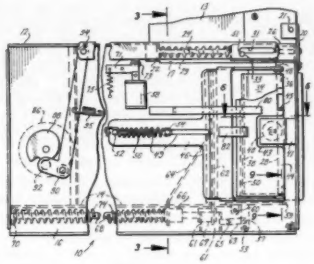
3,851,744

ESCROW STACKER FOR PAPER CURRENCY

Gustav F. Erickson, Hot Springs, Ark., assignor to UMC Industries, Inc., New York, N.Y.

Filed Aug. 3, 1973, Ser. No. 385,417
Int. Cl. B69h *29/14*
U.S. Cl. 194—4 R **17 Claims**

1. A combination escrow-stacker for paper currency which comprises walls defining a space that can receive bills, escrow means in communication with said space to receive and temporarily grip bills which are moved into said space, stacker means in communication with said escrow means to receive bills from said escrow means and to hold said bills under pressure in a stack, bill-moving means to move bills in said space into a position where they are gripped by said escrow means and to subsequently move bills gripped by said escrow means into a second position where they are held under pressure by said stacker means, said escrow means and said stacker means being so disposed relative to said space that bills which are moved into said space are moved along a predetermined path by said bill-moving means as they are successively moved into positions where they are gripped by



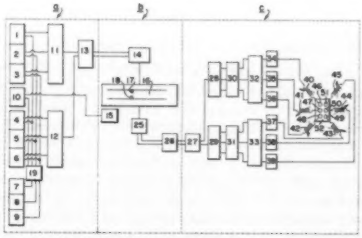
said escrow means and are held under pressure by said stacker means, and bill-returning means which coact with said escrow means to selectively return bills that are gripped by said escrow means, said bill-returning means and said escrow means providing a path of movement, for said bills which are to be returned, that is at least in part separate and distinct from said predetermined path.

3,851,745

ELECTRIC BRAILLE RECORDING AND REPRODUCING SYSTEM

Sirou Okazaki, Okayama, and Kenjiro Ito, Kawasaki, both of Japan, assignors to Nippon Typewriter Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 155,803, June 23, 1971, abandoned. This application Oct. 16, 1973, Ser. No. 406,908
Claims priority, application Japan, June 29, 1970, 45-56699; June 29, 1970, 45-56700
Int. Cl. B41j *3/32*
U.S. Cl. 197—6.1 **18 Claims**



1. In a braille recording and reproducing system, signal generator means for producing ac signals of different frequencies, at least two mixer circuits connected to said signal generator means for mixing signals selectively supplied thereto from said signal generator means, a braille keyboard including a master key and two sets of point keys corresponding to the six

points in a braille character, each of said sets of point keys consisting of three-point keys, one of said sets of point keys when selectively pushed supplies accordingly different ac signals from said signal generator means to one of said mixer circuits and the other of said sets of point keys supplies different ac signals from said signal generator means to the other of said mixer circuits, dual channel magnetic recording and reproducing means operatively connected to said mixer circuits for recording on a recording medium electric signals each consisting of a combination of different frequencies depending on which of said point keys were operated, and an oscillator control circuit to supply simultaneously said different ac signals preselected by said two sets of point keys to both of said mixer circuits after a given time delay sufficient to allow said recording and reproducing means to start and reach a constant speed, and said master key operatively coupled to said magnetic recording and reproducing means and to said oscillator control circuit to initiate operation thereof responsive to actuation of said master key.

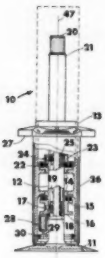
3,851,746
PLATEN FOR MULTIPLEX TYPEWRITER OR SIMILAR DEVICES

Borislav S. Ivanov, and Raina V. Ivanova, both of P.O. Box 145, Stn. D, Toronto, Ontario, M6P 3J5, Canada

Division of Ser. No. 383,633, July 30, 1973, which is a continuation-in-part of Ser. No. 217,442, Jan. 13, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 428,223

Int. Cl. B41j *11/02*

U.S. Cl. 197 –144 **5 Claims**



1. A platen for use in a multiplex typewriter or similar device comprising a cylindrical platen mounted on a tubular vertical stationary column and having first longitudinal and second rotative sliding movements on the column about its own longitudinal axis, a threaded drive shaft within the column, a first step motor and mechanical means connected to the drive shaft for moving the shaft and thereby the platen in the first direction in drive mode and step mode variants, said column having three vertical slots spaced equidistantly at 120° and through which the mechanical means extends the movement of the drive shaft to the platen, a second step motor and mechanical means for moving the platen in the second direction also in drive mode and step mode variants, pulse circuit means feeding pulses to the step motor means and means for adjusting the extent of movements of the platen upon a single operation of each step motor means to change the corresponding letter and line spacing of typing by a selected typing mechanism of an associated tyewriter or similar device.

3,851,747
DEVICE FOR TRANSFERRING WORKPIECES FROM A STATIONARY SUPPLY SOURCE TO A MOVING MACHINE

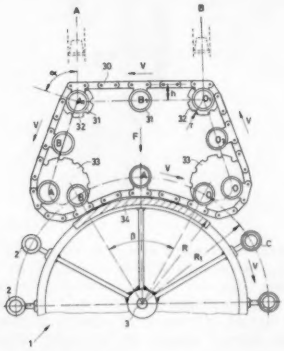
Humphrey Alphons Victor Van Der Roer, Freiburg, Switzerland, assignor to Polytype AG, Frieburg, Switzerland

Filed Aug. 31, 1972, Ser. No. 285,303

Claims priority, application Switzerland, Sept. 1, 1971, 12966/71

Int. Cl. B65g *47/00*

U.S. Cl. 198—22 R **3 Claims**



1. Device for loading workpieces comprising a machine rotating about an axis, said machine having at least one receiving portion thereon spaced radially outwardly from its axis and arranged to receive a workpiece, means spaced from said machine for supporting a stationary supply of workpieces, and means for transporting workpieces from the stationary supply to said machine, said means for transporting workpieces comprises an endless member, at least one carrying element attached to said endless member for holding a workpiece as it is moved from the stationary supply of workpieces to the receiving portion on said machine, said endless member moving said carrying elements at least during a portion of its travel at a speed equal to the speed of travel of the receiving portion on said machine, and a supporting member forming a track defining an arc of a circle for said endless member in a portion of its path of travel, the position of said supporting member being adjacent said means for supporting a stationary supply of workpieces and being spaced from said machine, and said carrying element being attached to said endless member so that in the passage over the track formed by said supporting member of the portion of said endless member to which said carrying member is attached, said carrying element effects a rotary movement about its axis while its axis remains stationary so that a workpiece can be moved from the stationary supply into said carrying element while its axis remains in the stationary position, a plurality of said supporting members are arranged in spaced relationship for the passage of said endless member thereover, said means for transporting workpieces includes a fixed curved guideway forming an arc of a circle with its center of curvature coinciding with the axis of said machine, said guideway defining the path of travel of said endless member with its carrying element in alignment with the receiving portion of said machine for effecting the transfer of a workpiece from the carrying element to the receiving portion, said endless member comprises a chain formed of a plurality of links, a plurality of said carrying elements located at uniformly spaced positions on said chain and each said carrying elements secured to and extending laterally and perpendicularly from one of said links, and said means for transporting workpieces includes a pair of said supporting members, said supporting members being spaced apart at a

multiple of the spacing between said carrying elements, said supporting members comprising first sprocket wheels, each having a radius to the point of engagement with said links of said chain equal to the dimension between the center of said chain and the center of said carrying elements.

3,851,748

APPARATUS FOR DIVIDING A CONTINUOUS STREAM OF ARTICLES INTO BATCHES WHICH MAY BE PLACED IN CONTAINERS

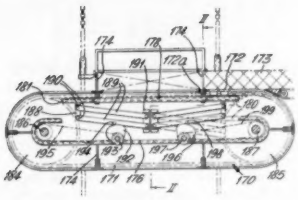
William Robert Garton, London, England, assignor to Molins Limited, London, England

Filed July 18, 1973, Ser. No. 380,243

Claims priority, application Great Britain, July 21, 1972, 34124/72

Int. Cl. B65g *47/26*

U.S. Cl. 198—34 **20 Claims**



1. Apparatus for separating a leading end portion of a stream of articles from said stream comprising means to feed said stream of articles along a defined path, separating means associated with said feed means, a first fixed track in a first plane, a second fixed track in a second plane, a movable track, means for effecting reciprocal movement of said movable track from said first plane to said second plane, and means for moving said separating means along said tracks, said tracks being positioned with said second fixed track closer to said defined path than said first fixed track so that said separating means is clear of said stream while it is moving along said first fixed track and is projected through said stream while it is moving along said movable track during movement of the latter from said first to said second plane, said separating means when moving between said first and second tracks having a first component of movement due to its motion along said movable track and a second component of movement due to movement of said movable track between said first and second planes.

3,851,749

DRAG LINES FOR CONCRETE

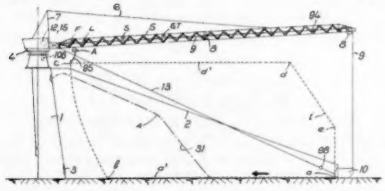
Lucien Rene Vidal, Domaine de la Pimpine, 33360 Latresne, France

Filed May 22, 1973, Ser. No. 363,170

Claims priority, application France, May 23, 1972, 72.18370

Int. Cl. B65g *65/28*

U.S. Cl. 198—36 **9 Claims**



1. An improved drag line system comprising a tower, radial walls extending from said tower to define separating bunkers, infeed ports provided at the bottom of said tower in each of said bunkers, a rotary platform mounted on an elevated portion of said tower, a cantilever jib mounted on said rotary platform, an idler roller at the outer end of said cantilever jib, a bucket return winch mounted on said rotary platform, a return cable wound on said bucket return winch and extending over said idler roller, a scraper bucket having said return cable fastened to a back portion thereof, a scraping winch on said platform, a scraping cable wound on said scraping winch and having its outer end connected to a front portion of said scraper bucket and control means for controlling said bucket return winch and said scraping winch for sequentially moving the bucket in a closed loop of travel in a vertical plane comprising a lower scraping path inwardly toward said tower, a lifting path upwardly adjacent the tower at the inner termination of the scraping path, a return path from the upper termination of the lifting path outwardly toward the outer end of said jib and a lowering path from the outer termination of the return path to the outer end of the scraping path, said control means including an active sensor means for detecting movement of the bucket to a position closely adjacent the tower by the scraping winch for immediately stopping the winding of the scraping winch and providing a time delayed initiation of operation of the winding of the return winch and unwinding of the scraping winch to initiate movement of said bucket along said return path.

3,851,750

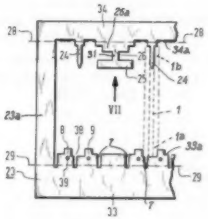
METHOD FOR THE PRODUCTION OF PLASTIC

Ferdinand Utner, Roter-Brach-Weg 99, 84 Regensburg, Germany

Division of Ser. No. 200,124, Nov. 18, 1971,. This application Jan. 22, 1973, Ser. No. 325,614

Int. Cl. B65g *15/00*

U.S. Cl. 198—131 **2 Claims**

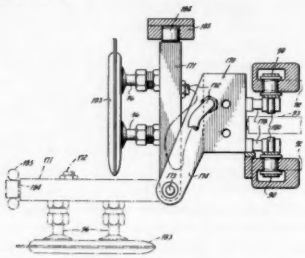


1. A transporting belt means for the continuous production of plastic covered coils, each coil having a tubular core member, said belt comprising two generally parallel first and second portions spaced apart a distance generally equal to the length of the tubular core members, said first portion of said belt having an inner edge with a plurality of spaced mounting supports projecting toward said second portion and said second portion having a plurality of spaced mounting rods generally projecting toward said first portion, said mounting rods and said mounting supports being alternately spaced, said first portion having contact portions on said inner edge facing said mounting rods and arranged alternately of said mounting rods on said second portion, said first and second portions extending inwardly from said inner edge on opposite sides of each contact portion, each mounting rod and each mounting support being arranged to accommodate said first and second portions to be cut along lines inwardly of and roughly parallel to the inner edges thereof whereby said mounting rods and mounting supports will be separated from said transporting belt means.

3,851,751
METHOD AND APPARATUS FOR FORMING, FILLING AND SEALING PACKAGES

Wickliffe Jones, Cincinnati, Ohio, assignor to R. A. Jones & Company, Incorporated, Covington, Ky.

Filed Apr. 26, 1972, Ser. No. 247,574
Int. Cl. B65g *15/00*
U.S. Cl. 198—179 2 Claims

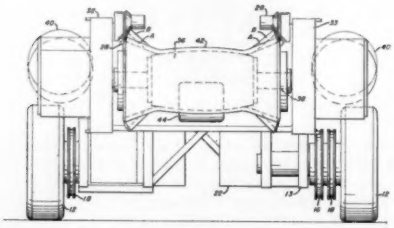


1. Conveyor apparatus comprising,
an endless chain,
means for driving said chain in an endless path,
a plurality of valve bodies mounted on said chain in spaced relation,
vacuum operated devices carried by said bodies and operable by said bodies upon evacuation of said bodies to support articles,
tubing serially interconnecting said bodies and forming an endless path for evacuating all valve bodies,
and means including a vacuum source whose location is fixed relative to the path of said chain for engaging said bodies sequentially to apply vacuum to said bodies over at least a portion of their excursion.

3,851,752
SELF-TROUGHED CONVEYOR BELT REVERSING APPARATUS AND METHOD

Neal W. Densmore, 452 Wendy Way, Franklin, Pa. 16323

Filed May 3, 1973, Ser. No. 356,843
Int. Cl. B65g *15/08*
U.S. Cl. 198—192 10 Claims

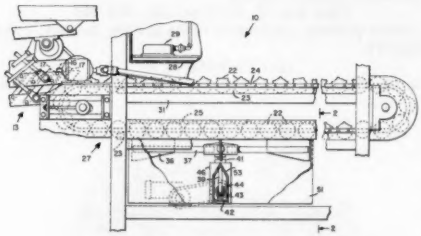


1. In a transfer terminal for a mobile belt conveyor having a transversely flexible self-troughed conveyor belt with a horizontal base portion and obliquely raised side portions producing a given side height, the improvement comprising: a belt reversing pulley means having an effective pulley length substantially equal to the width of said belt base portion; said pulley means forming a crowned pulley assembly with a ratio of effective crown radius to pulley major diameter no greater than about four to one; said crowned pulley being cooperable with said belt to substantially reduce the side height from said given height while said belt is in contact with said pulley means.

3,851,753
ROLLER CLEANING MECHANISM

Louis P. Lazzarini, and Traner J. Smith, both of San Jose, Calif., assignors to Genevieve I. Hanscom, Santa Cruz, Calif.; Genevieve I. Hanscom; Robert Magnuson; Robert Thomson and Lois J. Thomson, Trustees of the Estate of Roy M. Magnuson, deceased

Continuation of Ser. No. 46,228, June 15, 1970,. This application July 11, 1973, Ser. No. 378,062
Int. Cl. B65g *45/00*
U.S. Cl. 198—229 5 Claims

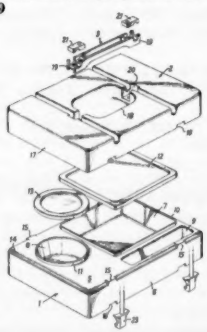


1. In a peeling machine, a roller conveyor for traveling through a treating zone to carry products to be treated therein, said roller conveyor comprising a plurality of rollers and having a return stretch; a track for controlling the travel of the roller conveyor and predetermining the path of the rollers comprising said return stretch during their travel through a cleaning zone; rotary blades mounted for rotation in a path parallel to and closely adjacent one stretch of said roller conveyor, said blades moving in closely spaced relation with respect to said rollers during travel through said cleaning zone for effecting removal of excess material adhering thereto; a sprocket provided at one end of each roller, the sprockets on adjacent rollers alternating from end to end; and, a pair of fixed chains mounted on said machine so as to be engaged by said sprockets during their travel through the cleaning zone.

3,851,754
STACKED TRAYS

Ralph Godfrey Jones, Markfield, England, assignor to Preci-Spark Limited, Syston, England

Filed Nov. 3, 1972, Ser. No. 303,345
Claims priority, application Great Britain, Feb. 4, 1972, 5263/72
Int. Cl. A45c *11/20*; B65d *21/02*
U.S. Cl. 206—549 4 Claims



1. An assembly of stacked interfitting trays, each tray comprising a top with a depending skirt around the perimeter

thereof, a groove formed at the junction between the top and the skirt and extending about the perimeter of the tray, said groove interfitting with the bottom edge of an identically shaped skirt of the tray next above it in the stack, each tray having at least two locating recesses in the bottom edge of the skirt and at least two raised lugs formed by interruptions in said groove and extending upwardly from the plane of the bottom of the groove, the lugs being shaped to mate with and positioned along the groove to fit snugly into said recesses of an identically shaped skirt of the tray next above it in the stack, and recessed compartments formed into said top,

and further including,

a cover disposed above the uppermost tray, said cover including a said depending skirt with recesses interfitting with the groove and the lugs of the uppermost tray, respectively,

a handle attached to the cover,

and a quick release tie means about all of the trays and the cover for holding the assembly together as a unitary pack.

3,851,755

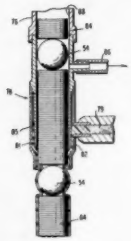
HEAT SHRINKABLE COIN PACKAGE

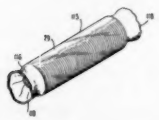
Gerry G. Hull, and Eugene B. Morris, Jr., both of Atlanta, Ga., assignors to AFL Machine Corporation, Atlanta, Ga.

Continuation of Ser. No. 48,077, June 22, 1970,. This application June 15, 1972, Ser. No. 263,313

Int. Cl. A45c *11/28*

U.S. Cl. 206—.82 **4 Claims**





1. A package of coins or the like comprising a plurality of coins positioned in flat overlying abutting relationship to form a stack of coins, a transparent open ended tube surrounding said stack of coins with the end portions of said tube drawn in at the ends of the stack of coins uniformly about the periphery of the outside surface of each end coin to a diameter less than the diameter of the coins in the stack of coins to confine the end coins about their peripheries in said stack and flared out from the drawn in portions and terminating with a diameter approximately as large as the diameter of the coins in the stack of coins.

3,851,756

COMBINED SAW HORSE AND TOOL BOX

Joseph E. Brown, Stephentown, N.Y., assignor to The Raymond Lee Organization Inc., New York, N.Y.

Filed Aug. 14, 1973, Ser. No. 388,127

Int. Cl. B25h *1/12;* **A47b** *85/00;* **B65d** *25/28*

U.S. Cl. 206—216 **5 Claims**

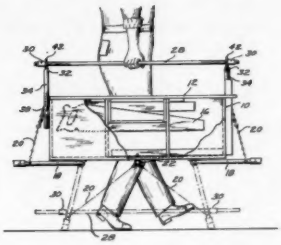
1. A combined saw horse and tool box comprising:

a horizontally elongated hollow rectangular parallelpiped body;

leg means pivotally secured to the bottom of the body, said means having a folded position at which it extends along the bottom and an extended position at which it extends inclinedly downwards from the bottom;

first and second L shaped members;

means securing each member along the outside of a corresponding one of the ends of the body in a position at which the horizontal legs of the members are parallel,



disposed above the top of the body and extend transversely the horizontal longitudinal center line of the body, the means enabling the vertical separation between horizontal leg and top of the body to be adjusted as desired; bracket means secured to the horizontal legs of each member; and

a horizontally elongated handle parallel to said longitudinal center line and extending between said bracket means, each end of the handle detachably engaging the corresponding bracket means.

3,851,757

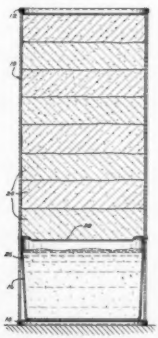
DOUGH PACKAGE CONTAINING TRIPLE SEALED ICING CUP AND METHOD OF PRODUCING THE SAME

Charles H. Turpin, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Mar. 29, 1973, Ser. No. 345,927

Int. Cl. B65d *17/02*

U.S. Cl. 206—223 **6 Claims**



1. A multi-compartment dough container comprising a fiber can body of cylindrical configuration, end walls sealed to each end of the fiber container to close the ends thereof, a separator plate positioned in the cylindrical fiber container in a plane extending normal to the axis thereof and having a first interference fit therewithin, a cup between the separator plate and one end of the fiber container, the closed end of the cup facing the adjacent end of the container, the cup being formed from a thermoplastic resinous material, the lower edge of the pe-

riphery of the separator plate being in continuous contact with the upper edge of the cup and a second interference fit between the cup and the inner wall of the fiber container at a location adjacent to the said separator plate to thereby define a triple seal comprising a first seal between the separator plate and the adjacent circular section of the inner wall of the fiber container, a second seal between the separator plate and the cup and a third seal between the portion of the cup adjacent the separator plate and the inner wall of the fiber container, said triple seal being effective to reduce the extrusion of dough from the dough compartment above the separator plate into the space between the cup and the fiber container.

3,851,758

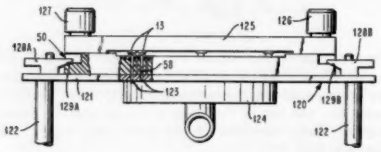
SEMICONDUCTOR CHIP FIXTURE

Manik P. Makhijani, and Frank Scacciaferro, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1972, Ser. No. 247,614

Int. Cl. B01j *17/00;* **B25b** *11/00;* **B65d** *85/42*

U.S. Cl. 206—328 **3 Claims**



1. A fixture for storing a plurality of semiconductor chips in adjacent, side by side relationship, each of said chips including a kerf at least intermediate adjacent chips; said fixture comprising a first cover member, a second cover member, a resilient pad in said second cover member, and a first group of apertures in said pad and second cover and dimensioned for alignment with individual ones of said chips to permit subjecting said chips to a vacuum through said pad and cover, and a second group of apertures dimensioned for alignment with the kerfs of said chips, and means to hold said covers together while compressing said resilient pad against said chips.

3,851,759

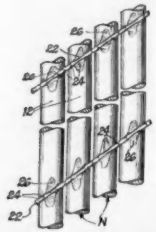
NAIL STRIP AND METHOD OF MAKING SAME

Hobart P. Young, Winnetka, and Donald W. Noren, Morton Grove, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Continuation of Ser. No. 217,868, Jan. 14, 1972, abandoned. This application Oct. 16, 1973, Ser. No. 406,795

Int. Cl. B65d *79/00;* **B23p** *11/00*

U.S. Cl. 206—338 **15 Claims**



1. A nail strip for use in a nailing machine comprising: a multiplicity of nails, each having a head portion, an elongated shank, and a point, with their points all facing the same direction, a shank of one nail being disposed closely adjacent a shank of a next adjacent nail, each said shank defining a notch disposed transversely with respect to the shank, the notches being aligned in an outwardly facing surface of the nail strip to provide a row of aligned notches; an elongated metallic filament disposed in said row of notches, said filament defining multiple zones of diminished cross section at predetermined intervals along its length, said zones being adapted to facilitate severance of portions of said filament from said filament at said zones when a nail is driven by a nailing machine from said strip, and shank material adjacent said notches mechanically gripping said filament in said notches.

3,851,760

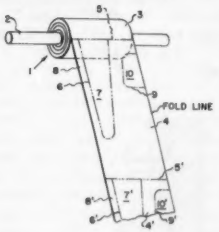
ROLL OF PLASTIC FILM APRONS

Ruford Bryan Smith, P.O. Box 567, Paxton, Ill. 60957

Continuation of Ser. No. 144,154, May 17, 1971, Pat. No. 3,735,865. This application Mar. 16, 1973, Ser. No. 342,170The portion of the term of this patent subsequent to 1991, has been disclaimed.

Int. Cl. B65d *85/66, 85/67*

U.S. Cl. 242—55.53 **1 Claim**



1. A roll of plastic film aprons comprising an elongated strip of plastic film folded in half longitudinally and wound in said longitudinally folded form as a roll on a core or roller, said folded film having a plurality of perforations extending transversely thereto at predetermined longitudinally spaced intervals to facilitate tearing discrete portions of plastic film from the roll, said folded plastic film having a plurality of perforations adjacent to each set of transversely extending perforations extending from the edge fold to define a subsequently removable portion of plastic film which when removed leaves an opening at said edge, said folded plastic film having an arcuate cut-out portion beginning at each set of transversely extending perforations and extending parallel to the edge opposite said fold, curving transversely, and then extending back to said transversely extending perforations, to define tie straps at one side, said plastic film being severable from said roll and the portion defined by said perforations being removable to define an apron having tie straps extending upward from a base portion and having a central neck opening, when the film is unfolded.

3,851,761

PRESSURE-SENSITIVE ADHESIVE TAPES INCLUDING A POLYCARBAMATE RELEASE COATING

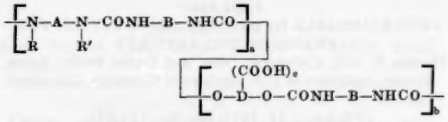
Andor Schwarcz, Niskayuna, N.Y., assignor to Nashua Corporation, Nashua, N.H.

Filed Sept. 28, 1972, Ser. No. 292,905

Int. Cl. C09j *7/02*

U.S. Cl. 206—411 **10 Claims**

1. A pressure-sensitive adhesive tape comprising a backing member, a pressure-sensitive adhesive on the front side thereof, and as a release agent on the backside thereof, a polymeric composition of the general recurring formula:



wherein A is an alkylene radical containing about two to six carbon atoms, B is an arylene radical containing about six to 16 carbon atoms, D is an aliphatic organic radical containing about two to six carbon atoms, R is an alkyl radical containing about 12 to 25 carbon atoms, R′ is hydrogen or an alkyl radical containing about one to 25 carbon atoms, *a* and *b* represent the number of recurring units and the ratio of *b*/*a* varies from 0 to 2, and *c* is 0, 1 or 2.

3,851,762

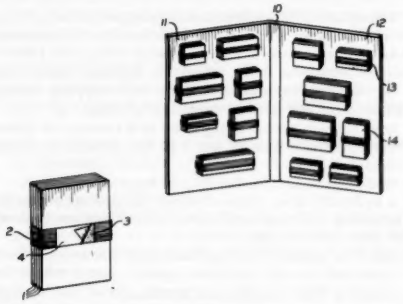
PACKAGING ASSEMBLY

Herbert Liblick, Whitestone, N.Y., assignor to Distribu-U-Mat, Inc., New york, N.Y.

Continuation of Ser. No. 875,810, Nov. 12, 1969, abandoned. This application Oct. 12, 1971, Ser. No. 188,521

Int. Cl. B65d *73/00, 85/00*

U.S. Cl. 206—425 **5 Claims**



1. A package assembly for displaying and storing a plurality of independent packets of advertising newspaper mats materials comprising at least one generally rectangular panel, a plurality of said packets of advertising mats each comprising single, completely separated sheets of paper products of substantially equal size arranged in superposed relationship, continuous elastic band holder means encircling and securing together said stacked single completely separated sheets of paper products in an oriented position, a pressure-sensitive adhesive carried on the back of said band holder means securing said holder means to said panel, said single sheets of paper products being removably retained within said band holder means.

3,851,763

COMBINATION SPADE OR SHOVEL AND SIFTER

Charles W. Ball, 155 Ocean Ave., Bridgeport, Conn. 06605, and Alexander Brodsky, 153 Birch Rd., Fairfield, Conn. 06430

Filed Mar. 27, 1972, Ser. No. 238,035

Int. Cl. B07b *1/02*

U.S. Cl. 209—419 **5 Claims**

1. A dual-purpose garden tool commprising, in combination:

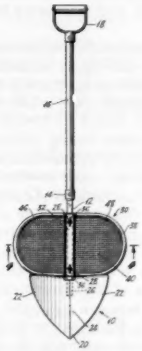
a. an imperforate shovel blade,

b. an elongate handle to one end of which the shovel blade is attached,

c. a hand grip secured to the other end of the handle,

d. expansive, substantially planar sifter means separate from said blade and attached to the handle adjacent and above said blade, and

e. a stirrup carried by the handle adjacent that portion of the sifter means which is remote from the shovel blade, said stirrup projecting from the handle in a direction away



from the plane defined by the sifter means,

f. said sifter means comprising two halves symmetrically disposed on opposite sides of the handle,

g. each of said halves having a substantially planar configuration,

h. the plane of one of said halves making a slight angle with respect to the plane of the other half.

3,851,764

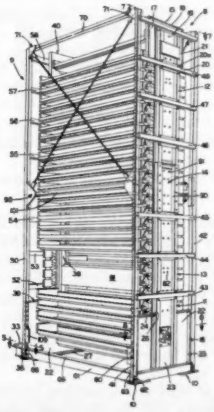
POWER FILE CONSTRUCTION

Walter G. Anders, Canton, Ohio, assignor to Diebold Incorporated, Canton, Ohio

Filed Mar. 29, 1973, Ser. No. 345,875

Int. Cl. A47f *3/08, 5/03*

U.S. Cl. 211—1.5 **10 Claims**



1. In a generally upright power file of the type in which a plurality of pans are mounted on an endless conveyor for movement in either direction in a continuous orbit of travel; in which any selected pan is delivered by power means to a work station location; in which the support means includes header and footer members and vertical column means ex-

tending from the bottom to the top of the file, and between and is attached to said header and footer members at each side of said file; and in which the conveyor is supported by the support means; the improvement which includes:

a. bottom frame means defining a generally rectangularly shaped base area having front and rear corners;

b. corner posts located adjacent each corner secured at their lower ends to the bottom frame means and extending vertically to the file top, said corner posts being spaced forwardly and rearwardly from the vertical column means;

c. a plurality of horizontal cross members extending continuously between and rigidly secured to one of the front and one of the rear corner posts at intervals spaced vertically along the length of the corner posts on both sides of the file;

d. the cross members having planar, uninterrupted top surfaces, being free of protuberances and the like the top surfaces of selected cross members being horizontally aligned with the top surfaces of other selected cross members located on the opposite side of the file;

e. the cross members being secured intermediate their ends to the outer surface of the vertical column means at spaced intervals throughout the column means length;

f. the top surfaces of the cross members being generally horizontally flat between the corner posts and the vertical column means and adapted to receive and support construction platforms extending horizontally between selected cross members on opposite sides of the file during file erection;

g. brace means extending between and secured to at least the rear corner posts; and

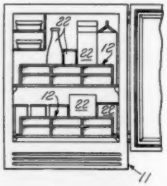
h. the vertical column means, corner posts, cross members, bottom frame means and brace means comprising a file frame to support the entire file load on a supporting surface.

3,851,765

ARTICLE RETAINER FOR A REFRIGERATOR

Don O. Cox, 627 E. Magnolia Blvd., Burbank, Calif. 91501

Filed Oct. 6, 1972, Ser. No. 295,677
Int. Cl. A47f *5/00*
U.S. Cl. 211—184 **4 Claims**



1. In combination, retainer means and a shelf, said shelf constructed of a plurality of parallel spaced elongated wirelike means, said retainer means comprising an elongated member constructed of a pliant material, said member including a shoulder along one of the long member edges extending substantially normally from said member, said shoulder having wall portions defining a plurality of slots extending transversely thereof and each said slot terminating in an associated opening in the member;

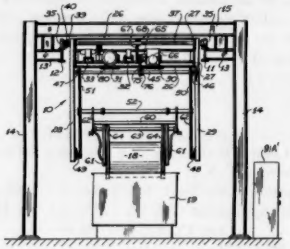
certain of said slots and associated openings receiving the wirelike means with the elongated member being flexed about at least one transverse axis to conformingly contact the article and secure it against horizontal movement on said shelf, the diameter of said wirelike means being greater than the width of said slots and being substantially equal to the diameter of said openings, whereby said wirelike means are snapped into said openings.

3,851,766

PROGRAMMABLE HYDRAULIC DRIVE SYSTEM FOR TRANSPORTING ARTICLES

Thomas R. Gill, Cleveland, Ohio, and Daniel Bailly, Ayieu, France, assignors to G S Equipment Company, Cleveland, Ohio

Filed Oct. 21, 1971, Ser. No. 191,253
Int. Cl. B66c *17/00*
U.S. Cl. 212—20 **12 Claims**



1. A programmable material handling apparatus for conveying work loads over a path of travel defined by a longitudinal runway to selected work stations spaced along said path of travel, said apparatus being actuatable through repeated cycles of acceleration, deacceleration and stopping during movement over said path of travel, comprising:

a. hoist support means engaged on said runway for movement over said path of travel to the selected work stations;

b. load hoist means carried by said support means;

c. a hydraulic drive system carried on said apparatus for actuating it through said cycles of acceleration, deacceleration, and stopping;

d. said drive system including fluid motor means operatively connected to said movable support, pump means for supplying fluid to said motor means, closed loop hydraulic circuit means connecting said pump means to said motor means so that fluid supplied to said motor means is returned directly to said pump means;

e. a plurality of position sensing means for developing a pattern of control signals representative of the actual position of said movable support along a workpath;

f. programmable circuit means for developing a predetermined pattern of program signals representative of the position of a preselected work station, said programmable circuit means including a program board and a control circuit having a plurality of circuit connection means positioned on said board at positions corresponding to the positions of said work stations along said workpath, said control circuit having an output circuit means for developing a pattern of signals corresponding to a preselected program, and actuatable switching means for actuating selected ones of said circuit connection means to program said control circuit, said actuatable switching means being diodes which may be removably inserted into said program board for completing selected ones of a plurality of circuit connections;

g. comparator circuit means for developing a control signal having a value representative of the difference between the value of said pattern of program signals and the value of said pattern of control signals; and,

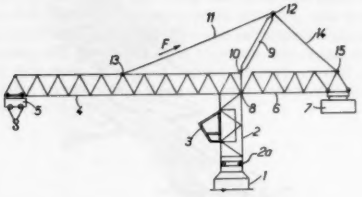
h. said hydraulic circuit means coupled to said comparator means for controlling the fluid supplied to said motor means in response to said control signal developed by said comparator means to thereby energize said fluid motor means for driving said movable support from said actual position to a preselected work station.

3,851,767

TOWER CRANES

Pierre Durand, Lyon, France, assignor to Richier, Paris, France

Continuation of Ser. No. 114,869, Feb. 12, 1971 abandoned. This application May 24, 1973, Ser. No. 364,300
Claims priority, application France, Feb. 13, 1970, 70.05190
Int. Cl. B66c 23/76
U.S. Cl. 212—48 3 Claims



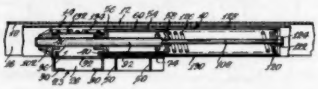
1. A tower crane, comprising:
a lower tower section and an upper tower section;
a jib supporting a burden-carrying crab movable along the length thereof, said jib is connected with the top part of said upper tower section so as to form therewith a rigid unit;
a counterweight-jib;
means for pivotally connecting said counterweight-jib to said rigid unit on the side thereof remote from said crab-jib;
a post erected on said rigid unit to project above the same; tie members attached to the upper end of said post for connecting said end to said crab-jib and to said counterweight-jib respectively; and
means for pivotally connecting the lower end of said post to said rigid unit so as to permit said post to swing fully under the action of the forces exerted on it by said tie members.

3,851,768

FILLING MEANS FOR AN IMPACT ABSORBING DEVICE

Vaughn T. Hawthorne, Mechanicsburg, Pa., assignor to Keystone Industries, Inc., Chicago, Ill.

Division of Ser. No. 191,634, Oct. 22, 1971, which is a continuation-in-part of Ser. Nos. 1,903, Dec. 17, 1969, abandoned, which is a continuation of Ser. No. 710,196, March, 4, 1968, abandoned. This application Mar. 15, 1973, Ser. No. 341,487
Int. Cl. B61g 9/08
U.S. Cl. 213—43 9 Claims



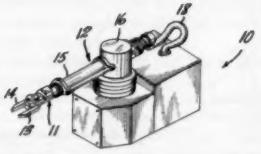
1. In a hydraulic cushioning unit for coaction between an underframe structure of a railway car and an elongated sliding sill structure longitudinally movable relative to the underframe structure, the improvement comprising:
a fluid reservoir,
a cylinder housed within and spaced from said reservoir,
a piston movable in said cylinder,
a pair of head members at opposite ends of said reservoir and cylinder,
one of said head members being provided with a pair of openings disposed at the lower portion of the reservoir when said unit is installed in a car,
removable closures in said openings, and
a pair of tubes communicating with said openings and extending upwardly within said reservoir and having open upper ends disposed in the upper portion of said reservoir,
whereby said reservoir is adapted to be filled with fluid by introduction of fluid through one of said openings and its associated tube until the fluid flows out through the other of said tubes and the other of said openings.

3,851,769

INDUSTRIAL ROBOT

Kazuo Noguchi, Tokyo; Shigeru Iwai, Chiba; Yukihiro Sato, Tokyo, and Yoshiaki Kitamura, Kamagaya-Machi, all of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Apr. 10, 1972, Ser. No. 242,565
Claims priority, application Japan, Apr. 9, 1971, 46-22149
Int. Cl. B25j 9/00
U.S. Cl. 214—1 BC 9 Claims



1. A programmable robot comprising: a mechanical unit for effecting diverse movements of an object comprising a movable transfer arm mounted for movement in a plurality of different directions, a manipulator device including actuatable gripping means for releasably gripping an object and connected to said transfer arm at one end thereof for movement therewith and mounted for movement in a plurality of different directions independently of the movement of said transfer arm, and electrically controlled fluid actuating means for independently effecting fluid actuation of both said transfer arm and manipulator device in response to electric command signals applied thereto, said electrically-controlled fluid actuating means comprising a first plurality of fluid motors connected to said transfer arm each operative in response to motive fluid supplied thereto and exhausted therefrom to effect reciprocal movement of said transfer arm along a different axis, said first plurality of fluid motors comprising a first reciprocatory fluid motor connected to said transfer arm to effect horizontal reciprocal movement thereof along a horizontal axis and a second reciprocatory fluid motor connected to said transfer arm to effect vertical reciprocal movement thereof along the vertical axis, a second plurality of fluid-motors connected to said manipulator device each operative in response to motive fluid supplied thereto and exhausted therefrom to effect angular oscillatory movement of said manipulatory device about a different axis, said second plurality of fluid motors comprising a first oscillatory fluid motor mounted at said one end of said transfer arm and connected directly to said manipulator device to effect turning oscillatory movement thereof about a horizontal axis and a second oscillatory fluid motor mounted at said one end of said transfer arm and connected directly to said manipulator device to effect swinging oscillatory movement thereof about a vertical axis, and a fluid circuit connected during use of the robot to a source of pneumatic motive fluid and operable to selectively and independently supply and exhaust motive fluid to each of said fluid motors, said fluid circuit including at least one electrically-operated solenoid valve associated with each fluid motor for controlling the application of motive fluid thereto in response to said electric command signals; and a control unit for applying electric command signals to said mechanical unit in accordance with a predetermined program of instructions comprising signal generating means for generating elec-

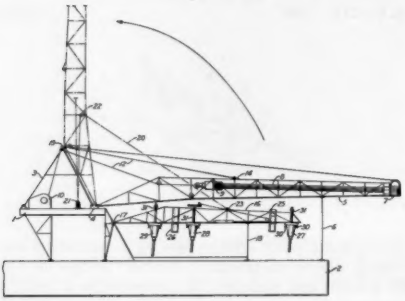
tric control signals in accordance with a predetermined program of instructions to be carried out by said mechanical unit, and an electric circuit having means receptive of said control signals for developing therefrom a series of electric command signals in accordance with said predetermined program of instructions and applying said electric command signals to each solenoid valve to accordingly control the movement of said mechanical unit.

3,851,770

PIVOTED WELL DRILLING MAST AND SEPARATE TOWER

Cecil Jenkins, and Joseph R. Woolslayer, both of Tulsa, Okla., assignors to Lee C. Moore, Tulsa, Okla.

Filed Apr. 30, 1973, Ser. No. 355,723
Int. Cl. E21b *19/00*
U.S. Cl. 214—2.5 **7 Claims**



1. Well drilling apparatus comprising a substructure having a front and a back, a mast with an open front side, means hinging the foot of the mast to the substructure on a horizontal axis, means for swinging the mast from a prone position in front of the substructure up to an upright position above the substructure, a pipe racking tower with an open back side, means hinging the foot of the tower to the substructure on a horizontal axis in front of and below said mast hinging means, a line attached to the upper side of the prone tower, sheave means up in the upright mast, said line passing over said sheave means and downwardly therefrom, means on said substructure for pulling on said line to swing the tower from a prone position in front of the substructure below the level of the prone position of the mast up to an upright position in front of the upright mast, and means for holding the mast and tower in said upright positions.

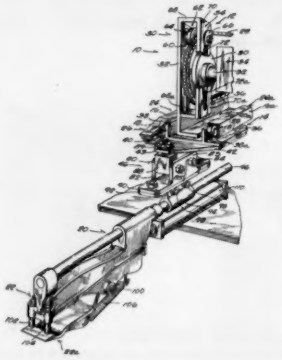
3,851,771

MATERIAL HANDLING DEVICE

Donald L. Hufford, Charlevoix, Mich., assignor to Hufford Industries, Inc., Charlevoix, Mich.

Filed Dec. 11, 1972, Ser. No. 314,125
Int. Cl. B66c *1/42*
U.S. Cl. 214—1 BB **11 Claims**

1. Apparatus for inserting or removing a work piece from a press comprising, in combination: a support; stationary guide means extending from said support toward the press, said guide means being channel shaped and having a horizontal portion and a terminal portion extending downwardly from the outer end of the horizontal portion at an incline thereto; carriage means having first and second longitudinally spaced rollers confined within said channel shaped guide means at all positions and movable along said guide means toward and away from the press; reciprocating drive means for continuously and reciprocally moving said carriage means back and forth along said guide means; and work handling means carried by said carriage means and having means for automatically gripping and releasing the work piece, said means for gripping and releasing the work piece being cooperatively associated with the position of said carriage means whereby as said carriage means is moved toward said press along said



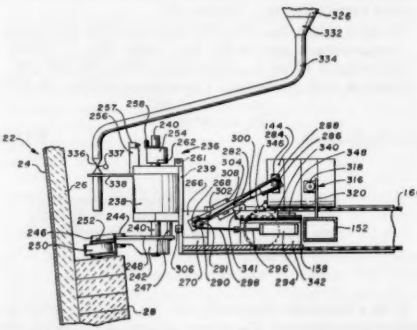
terminal guide portion, said means for gripping and releasing the work piece moves both vertically and horizontally on an incline into gripping engagement with the work piece, and as said carriage means is moved away from the press, said means for gripping and releasing the work piece grips the work piece to move it up and out of the press for travel along said horizontal portion.

3,851,772

DEVICE FOR TRANSFERRING OBJECTS

Ronald Eugene Williamson, Hammonsville; Sidney Clark Porter, Jr., East Liverpool, both of Ohio, and Kenneth Frederic Shotting, Coraopolis, Pa., assignors to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 253,546, May 15, 1972, Pat. No. 3,757,484. This application June 4, 1973, Ser. No. 367,077
Int. Cl. B65g *7/08*
U.S. Cl. 214—1 Q **6 Claims**



1. A device for transferring an object at a first location in a first position to a second location in a second position comprising:

two spaced arms;

arm rotating means for rotating said two spaced arms about a pivot axis;

gripping means for each of said arms for picking up said object on a common axis therethrough, at least one of

said gripping means being a rotating gripper rotatably mounted on one of said arms and adapted to impart rotation to said object upon rotation of said rotating gripper; and

object rotating means for controllably rotating said objects relative to said arms including a sprocket mounted to said rotating gripper and rotatable relative to said one arm, a spring means on said one arm, a chain adapted to engage said sprocket and having one end fixed to said spring, and a mounting point to which the other end of said chain is fixed, said mounting point being positioned separate from said arms such that, upon rotation of said arms about said pivot axis, the distance along said chain between said sprocket and said mounting point changes, said spring means thereby changing length and said sprocket thereby rotating said rotating gripper to rotate said object from said first position to said second position as said arm rotating means rotates said arms from said first location to said second location.

3,851,773

STACKING DEVICE, PARTICULARLY FOR NEWSPAPERS

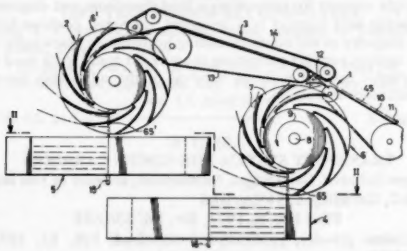
Willi Kluge, and Reinhard Kluge, both of D-63 Giessen, Kugelberg 55, Germany

Filed July 9, 1973, Ser. No. 377,716

Claims priority, application Germany, July 8, 1972, 2233750

Int. Cl. B65g *57/08*

U.S. Cl. 214—6.5 **12 Claims**



1. A stacking device for stacking of articles, particularly papers, which are of different thicknesses on opposite sides, comprising a catching mechanism for partial stacks and a rotating mechanism for rotating the partial stacks, said rotating mechanism having two rotary platens which are arranged at different heights and which can be oppositely rotated in a stepwise manner, said rotary platens each having at least two pockets for receiving partial stacks, the axes of rotation of which are both arranged vertically and which viewed in ground view are spaced from one another in such a manner that each one pocket of the upper rotary platen can be caused to coincide with one pocket of the lower rotary platen in a delivery position, stationary feed mechanisms for filling the pockets of the rotary platens, said feed mechanisms being arranged above the rotary platens, a deflector device for the alternate feeding of a continuous stream of articles to one of the feed mechanisms, discharge mechanisms for removing the partial stacks which are provided in the pockets, a lowering mechanism for lowering the upper partial stack onto the lower partial stack and a collecting mechanism for stacking the stack units one on top of the other, said stack units comprising the two aforementioned partial stacks.

3,851,774

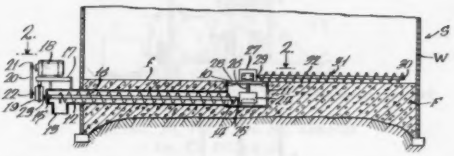
BOTTOM SILO UNLOADER

Jonathan J. Laidig, Mishawaka, Ind., and Loren P. Boppart, Harvard, Ill., assignors to Laidig Silo Unloaders, Inc., Mishawaka, Ind.

Filed Dec. 5, 1973, Ser. No. 421,855

Int. Cl. B65g *65/46*

U.S. Cl. 214—17 DA **12 Claims**



1. In a bottom silo unloader for use in the discharge of moist grain from a sealed cylindrical silo that has a floor with a center discharge hole, in combination:

a casing in said discharge hole that has an upper edge substantially flush with the floor;

a discharge tube communicating with said casing beneath the floor, said discharge tube having a discharge opening outside the line of the silo wall and an airtight closure for said opening;

a discharge auger in said discharge tube;

drive means mounted outside the silo and drivingly connected to said discharge auger;

a lower right angle gear box in the casing which has a horizontal input shaft coupled to the discharge auger;

means at the bottom of the casing restricting movement of said lower gear box;

an upper right angle gear box having a horizontal output shaft;

a vertical shaft drivingly connecting said gear boxes;

a sweep auger above the silo floor and rigidly drivingly connected to the output shaft of the upper gear box for revolving the sweep auger on its axis to feed grain into the casing;

a ring gear supported in the upper part of the casing for rotation about the axis of the vertical shaft;

means mounting said upper gear box on said ring gear;

and means for driving the ring gear from the drive means to rotate the sweep auger about the center of the silo.

3,851,775

MECHANISM FOR HANDLING A BULLET MELTED IN A HERMETICALLY-SEALED FURNACE

Anatoly Vladimirovich Zlotin, bulvar Lesi Ukrainki, 24b, kv. 77; Jury Mikhailovich Krivoshlykov, bulvar Lesi Ukrainki, 20, kv. 40, and Alexei Lavrentievich Tikhonovsky, ulitsa Vernadskogo, 73, kv.45, all of Kiev, U.S.S.R.

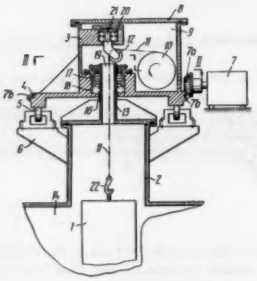
Filed Jan. 13, 1972, Ser. No. 217,526

Int. Cl. B66c *17/12*

U.S. Cl. 214—18 R **1 Claim**

1. In a hermetically-sealed electron-beam furnace having a melting zone and an upper part, a mechanism for handling a billet being melted in the furnace, said handling mechanism including a casing mounted for rotation relative to the furnace, said casing having an inner space, a tubular throat providing communication between the inner space of the casing and the interior of the upper part of the furnace, means between the casing and the tubular throat providing a hermetic seal between the casing and the upper part of the furnace, a rotatable drum means mounted within the inner space of the

casing to one side of the tubular throat, a loading chain wound on the drum means, drive means operably coupled to the drum means for rotating drum means, a roller means secured within the space of the casing between the drum means and the throat for guiding the loading chain vertically along the



geometrical axis of the throat, the inside diameter of the tubular throat being commensurable with the chain diameter and exceeding the chain diameter by 0.25—0.5 diameter of the circumscribed circle of the loading chain, and the loading chain having one end connected to a billet.

3,851,776

VEHICLE WITH COUNTER WEIGHT TURRENT LOCK

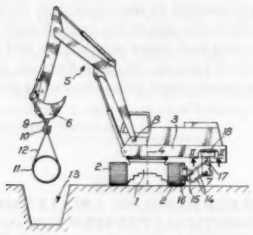
Pierre J. E. Leyrat, Trilport, France, assignor to Societe Anonyme Poclain Le Plessis Belleville, Oise, France

Filed Apr. 9, 1973, Ser. No. 349,101

Claims priority, application France, Apr. 18, 1972, 72.13632

Int. Cl. B66f 9/00

U.S. Cl. 214—142 **2 Claims**



1. A work vehicle having a vehicle frame supported by ground-engaging rolling members, a turret mounted to pivot about a vertical axis on the vehicle frame, work supporting means mounted on said turret and extending outwardly from said turret, a deformable quadrilateral support frame connected on one end to one side of said vehicle frame, a counterweight supported by said quadrilateral support frame, a stirrup carried on the lower portion of said turret comprising two spaced arms, a locking plate integral with said counterweight, said deformable quadrilateral frame being movable between a first or retracted position in which the counterweight is closely adjacent the vehicle frame and an extended position in which said locking plate is engageable with said stirrup between said spaced arms to lock said turret against rotation while simultaneously providing a counterweight function for said vehicle.

3,851,777

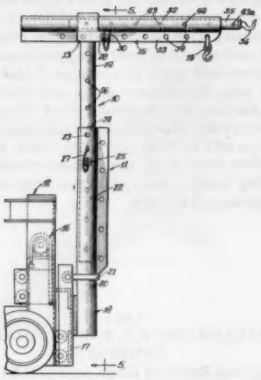
ADJUSTABLE BOOM ATTACHMENT

Mike M. Dilny, 4855 North Western Ave., Chicago, Ill. 60625

Filed June 13, 1972, Ser. No. 262,358

Int. Cl. B66f 9/06

U.S. Cl. 214—620 **19 Claims**



1. For use with a fork lift truck having a vertically movable lift member, an adjustable boom attachment comprising: an upright support; means for securing the support to the lift member for vertical movement therewith; a carrier mounted on said support and defining a through horizontal passage; a boom longitudinally movably fitted in said carrier passage and having a forward end selectively spaced forwardly of said upright support for supporting a load therefrom and disposed adjacent said support in a rearward, retracted position with the majority of the boom extending horizontally rearwardly of the upright support permitting the fork lift truck to be used in a normal manner without removal of the adjustable boom attachment therefrom.

3,851,778

TRANSPORT SYSTEM FOR GOODS CARRIERS

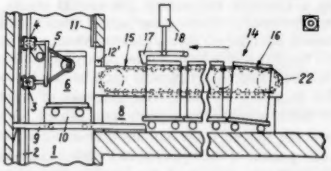
Eugen Schurch, Gerlafingen, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

Filed Feb. 8, 1973, Ser. No. 330,685

Claims priority, application Switzerland, Feb. 11, 1972, 2003/72

Int. Cl. B65g 1/06

U.S. Cl. 214—622 **10 Claims**



1. Transport system for goods carriers, for installation, at least in part, on a support surface and having a plurality of carrier units (**6, 7**) adapted to hold goods to be transported and equipped with laterally projecting brackets (**31**) extending from the upper portions of both sides thereof, movable main conveyor means (**1,2,3,4,5**) and selectively engageable means on the carrier units and the main conveyor means to lock selected units to the main conveyor, and

at least one loading station and at least one receiving sta-

tion, said loading and receiving stations being of similar construction and readily convertible one into the other and, in each case, comprising:

a pair of parallel, spaced, horizontally arranged branch conveyors (15) extending at an angle from the main conveyor means and being located above the support surface, the length and spacing of said pair of branch conveyors defining respectively the length and width of an area available for storing carrier units of said plurality, the spacing between said pair being suitable for engagement of said brackets (31) of said carrier units (6,7) from beneath by said branch conveyors, both branch conveyors of said pair having at their ends farthest from said main conveyor respective ramp portions having a progressively depressed elevation over the level of said support surface, the ends of said branch conveyors of said pair nearest said main conveyor being located suitably for transfer of said carrier units between said main and branch conveyors;

drive means for continuously operating said branch conveyors in the direction determined by whether they are part of a loading station or of a receiving station, and

restraining means (17,17') for holding at will at least one of said carriers (6,7) stationary while some part thereof is located between said branch conveyors and for allowing at will the continuously operating pair of branch conveyors to transport said at least one carrier,

said branch conveyors being equipped with freely rotatable support roller means (30) for allowing said at least one carrier to be held stationary by said restraining means while supported by said conveyors, without interfering with the operation of said drive means, and means to transport said carrier units between said main conveyor and said branch conveyors.

3,851,779

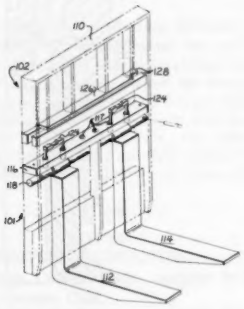
LIFT TRUCK FORK RETAINING PINS

John T. Crawford, Lyndhurst, Ohio, assignor to Towmotor Corp., Cleveland, Ohio

Division of Ser. No. 225,811, Feb. 14, 1972, Pat. No. 3,780,896. This application Aug. 17, 1973, Ser. No. 389,138

Int. Cl. B66f *9/06*

U.S. Cl. 214—731 **2 Claims**



1. In a lift truck of the type having an extensible mast structure, a carriage mounted for travel along said mast, and load forks mounted on said carriage with means for allowing side-to-side adjustment of said forks, the improvement comprising; fork retainer means coacting with said carriage and said forks to restrain said forks in a predetermined position on said carriage,

means for permitting at least partial removal of said retainer means from said carriage for adjusting said forks to new positions,

and positive restraining means coacting with said retainers to prevent loss of said retainers from said carriage, said positive restraining means comprising in combination, an upper portion of the carriage extending upwardly beyond the mounting position of said forks and said retainers, crossbar members defining a transverse recess and forming part of said carriage upper portion and positioned at a distance above said retainers such that the retainers may be moved upwardly in relation to said carriage and yet are retrained from being removed from said carriage by having the upper portion of said retainers being closely confined by said recess.

3,851,780

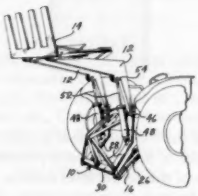
REAR END LOADER

Claude R. Martin, R.R. 2, Garthby, Co. Frontenac, Quebec, Canada

Filed Dec. 20, 1973, Ser. No. 426,919

Int. Cl. E02f *3/28*

U.S. Cl. 214—766 **10 Claims**



1. A loader adapted for connection to the regular 3-point rear end hitch of a tractor including two lifting bars pivoted underneath the differential housing and an upper link pivoted above the differential housing, said loader comprising:

a. a tractor attachment including first two posts adapted to be pivotally connected to the free ends of the lifting bars and extending upwardly and rearwardly from said free ends to a point substantially above and adjacent to the differential housing of the tractor, and a third post extending substantially vertically from a cross bar connected between the lower ends of said first two posts and provided at its upper end with a pivotal connection for the free end of the upper link of the 3-point hitch of the tractor;

b. lift arms pivotally connected to the upper ends of said first two posts to swing relative thereto about a first transverse axis;

c. hydraulic cylinder means interconnecting said first two posts and said lift arms for swinging said lift arms about said first transverse axis;

d. a bucket pivotally connected to the free end of said lift arms to pivot about a second transverse axis; and

e. means for pivoting said bucket about said second transverse axis.

3,851,781

NURSER BOTTLE CONSTRUCTION

Leslie Stephan Marco, 11133 S. 8th Ave., Palos Hills, Ill. 60664

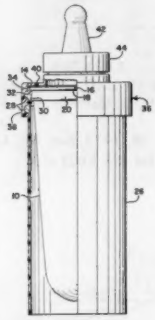
Filed Apr. 19, 1973, Ser. No. 352,851

Int. Cl. A61j *9/00*

U.S. Cl. 215—11 E **4 Claims**

1. In combination with a tube-like holder having external attachment means around the top portion thereof and internal upwardly facing shoulder means below the top peripheral edge thereof, the provision of a plastic bag-like container supported interiorly of the holder and including a flexible and

resilient rim portion with a bottom closed flexible body portion pendant therefrom, said rim portion providing a stacking formation for a nested supply of containers and including upper and lower generally horizontal wall portions with a downwardly and outwardly inclined wall portion joining the inner edge of the upper wall portion and the outer edge of the lower wall portion and with a peripheral wall upstanding from the outer edge of the upper wall portion and engaging the



inner surface of the top peripheral portion of the holder with the under surface of the upper wall portion supported on the shoulder means of the holder after relative telescopic association of the holder and container causing inward resilient deflection of the inclined wall and lower wall portion and resilient restoration thereof into engagement with the adjacent surface of the holder below the shoulder means trapping the container in the holder.

3,851,782

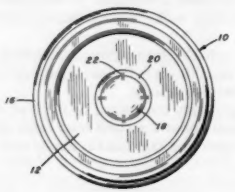
CONTAINER CLOSURE WITH VENT OPENING MEANS

Robert G. Clawson, Pershing, and Wilburn C. Willis, Richmond, both of Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 18, 1972, Ser. No. 281,715

Int. Cl. B65d *51/16*

U.S. Cl. 215—307 **6 Claims**



1. A metal container wall which includes a vent opening means comprising a hollow flexible embossment of generally hemispherical shape formed integrally in said container wall, an integral annular wall around said embossment extending at an angle from the outer periphery thereof to said container wall around the embossment to permit radial expansion of the embossment in response to pressure applied thereagainst, and further having at least one radially extending weakening line in the outer periphery of the embossment which is adapted to be ruptured upon radial expansion of the embossment.

3,851,783

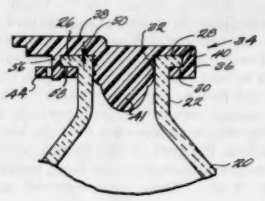
BOTTLE CLOSURE

Paul A. Braginetz, 302 Alpine Rd., Staunton, Va. 24401

Filed Feb. 6, 1973, Ser. No. 330,109

Int. Cl. B65d *39/00*

U.S. Cl. 215—232 **9 Claims**



1. A closure for a bottle having a neck portion terminating in an opening and a flange circumferentially extending about the opening comprising a collar with portions for engaging the upper and lower surfaces of said flange about a substantial portion of said flange part of the circumference to permit said collar to be freely rotated about said flange and a stopper pivotably attached to said collar with portions of said stopper engaging said upper surface of said flange and at least in part welded to said upper surface and having a portion for extending into said bottle opening to seal said opening.

3,851,784

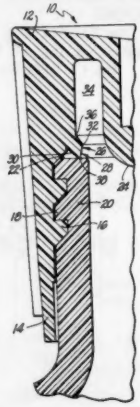
SEAL STRUCTURE

Bronislaus Gryncewicz, c/o Polytop Corporation, Slatersville, R.I. 02876

Filed Apr. 24, 1972, Ser. No. 246,775

Int. Cl. B65d *41/04*

U.S. Cl. 215—40 **1 Claim**



1. In a closure having a closure top and a peripheral skirt extending from the bottom of said top, said skirt including means for attaching said skirt to a container neck in a position in which said top extends across said neck, said closure including a seal structure which is integral with said top located within said skirt and beneath said top for forming a seal with respect to said neck, the improvement which comprises:

said seal structure comprising an annular sealing flange having a top, a bottom and concentric sides,

said sealing flange being spaced from the interior of said skirt and being formed of a resilient, flexible, self-supporting material, capable of engaging a container neck so as to form a seal therewith,

said flange extending generally parallel to the interior of the skirt, the lower end of said flange remote from said top having a V-shaped bottom, having a lower, downwardly directed edge having separate sides located at an angle with respect to one another of from about 20° to 40°, said flange being attached to said top along the side thereof and beneath the top of said flange remote from the center of said skirt and adjacent to the top of said flange, the innermost side of said flange being separated from a remainder of said closure by a recess, extending the length of said flange and above said flange and being entirely unattached and unsupported,

said flange being sufficiently flexible between its top and bottom so as to be capable of deforming to form a seal with a top of said container neck if such a top should have a surface irregularity or should not be flat in a place perpendicular to the axis of said skirt, said flange being mounted so that it will tend to flex inwardly in adjusting to the configuration and location of said container neck relative to the said skirt and said top in forming a seal with said neck,

said flange being the only sealing means on said closure top intended to contact the top of said container neck,

said cap having an inner surface which extends upward from said flange in vertical alignment with said downwardly directed edge.

3,851,785

AMPOULE CONSTRUCTION

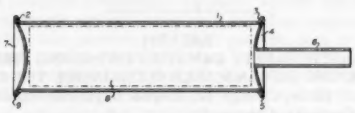
Karl A. Schulke, Neuberg, Germany, assignor to Heraeus-Schott Quarzschmelze GmbH, Quarzstrasse, Germany

Filed Mar. 27, 1972, Ser. No. 238,219

Claims priority, application Germany, Apr. 27, 1971, 7116134

Int. Cl. H01k *1/42*

U.S. Cl. 220—2.2 **4 Claims**



1. A diffusion ampoule for performing diffusion processes in semi-conductors having a tubular barrel, the ends of which are flanged, one of said flanged ends being closed with a cover member which is concave-convex shaped, the margin of said cover member being permanently placed in a gas-tight manner on the flanged marginal portion of the barrel, said cover member having at least one projecting tube, the other of said flanged ends being closed off in a gas-tight manner by a bottom member of concave-convex shape, said ampoule made of quartz glass.

3,851,786

COMPOSITE STRUCTURE

Charles E. Kaempen, Orange, Calif., assignor to Kaempen Industries, Inc., Orange, Calif.

Division of Ser. No. 161,536, July 12, 1971, Pat. No. 3,784,441. This application Sept. 21, 1973, Ser. No. 399,630

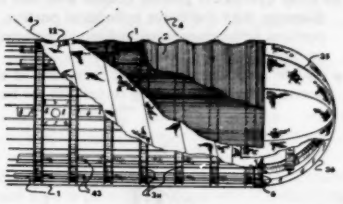
Int. Cl. F16j *11/06;* **B29c** *17/02;* **B32b** *5/12*

U.S. Cl. 220—3 **10 Claims**

1. A composite structure disposed on a horizontal axis thereof comprising

a first ply of tensioned and compacted continuous first filament strands extending generally in the direction of said axis,

a second ply of tensioned and compacted continuous second filament strands disposed transversely of and superimposed over said first ply to impose a substantially uniform load thereon to deflect said first and second plies into a connected plurality of corrugations, each of said corrugations comprising a corrugated biaxially tensioned laminate having a generally concave parabolic portion formed between a pair of adjacent convex portions intersecting therewith, when viewed in cross section, relative



to said axis, and

hardened adhesive means impregnating and bonding said first and second plies together in a common bonding matrix to maintain them and each of said plurality of corrugations in said corrugated laminate configuration.

3,851,787

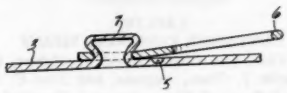
ALUMINUM ALLOY CAN END AND BODY

William C. Setzer, Hamden; Harvey P. Cheskis, Woodbridge, and Joseph Winter, New Haven, all of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 291,835, Sept. 25, 1972, Pat. No. 3,787,248. This application July 5, 1973, Ser. No. 376,740

Int. Cl. B65d *17/20*

U.S. Cl. 220—273 **5 Claims**



1. An easy open aluminum can having a body portion and end walls secured thereto, with one of said end walls having a removable portion with a tab element secured thereto by mans of an integral portion of said end wall, said body portion and end walls having substantially the same composition of an aluminum base alloy consisting essentially of magnesium from 0.4 to 2.0 percent, manganese from 0.5 to 2.0 percent, balance essentially aluminum, wherein the end wall having said removable portion has a minimum stretch forming height to diameter ratio of 0.210.

3,851,788

PLASTIC DRUM WITH REMOVABLE COVER AND LOCKING RING

Wilhelm Hammes, Hauptstrasse 38, 5203 Much, Germany

Filed Nov. 14, 1973, Ser. No. 415,539

Claims priority, application Germany, Nov. 27, 1972, 2258096

Int. Cl. A47j *27/08, 36/10;* **B65d** *45/00*

U.S. Cl. 220—319 **10 Claims**

1. A drum and cover therefor comprising:

a drum body portion of plastic composition having

a cylindrical neck extending axially parallel to the axis of the drum,

a drawn-in portion adjacent the top of the neck forming an annular bulged-in bead of smaller diameter than the neck,

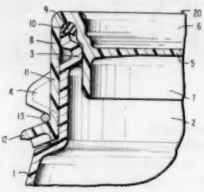
a plurality of bulge-like projections disposed circumferentially about the neck, each of said bulge-like projections having a lower surface slanting away from the outer cylindrical surface of the neck;

closure means for said drum comprising a cover having

an outer cylindrical portion adapted to fit tightly over the neck of drum, said outer cylindrical portion having cut out sections adapted to fit snugly over the bulge-like projections on the neck of the drum,

an inner cylindrical portion coaxial with and of smaller diameter than the outer cylindrical portion, said two portions being connected to form an external rim and an inner annular groove,

a lip-like reinforcement on the underside of said inner portion providing a bearing surface for the bead on the



neck of the drum, and

outwardly projecting reinforcements on the lower edges of the segments of the cover between the bulge-like projections on the neck of the drum, each of said reinforcements having a surface slanting away from the outer cylindrical surface of the cover;

sealing means in the bottom of the aforementioned annular groove; and

resilient locking means encircling the cover for securing said cover to the neck of drum.

3,851,789

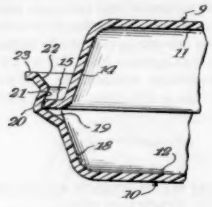
CONTAINER FASTENING MEANS

Charles B. Case, Eau Claire; David M. Hebert, Chippewa Falls; Maylin J. Olson, Augusta, and John C. Schubert, Chippewa Falls, all of Wis., assignors to Standard Oil Company, Chicago, Ill.

Filed Feb. 21, 1973, Ser. No. 334,367

Int. Cl. B65d *43/10*

U.S. Cl. 220—307 **4 Claims**



1. A container made of deformable plastic having first and second members, one of said members constituting the top of the container and the other the bottom thereof, each member being provided with a generally flat surface, one of said members having a sidewall attached to said flat surface which slopes away from said planer surface and a lip extending outwardly from the end of said sidewall, said lip being generally parallel to the flat surface of said member; the other of said members having a sidewall attached to the flat surface thereof adapted to engage frictionally the lip on the other of said members and having four sloping sections, the first sloping outwardly from the flat surface, the second sloping outwardly from the end of the first at an angle of 10° to 45° from the flat surface, the third sloping inwardly from the end of the second, and the fourth sloping outwardly from the end of the third, the apex of the angle between said second and third sections engaging the lip on said other member, said fourth cooperating with said lip to force said lip into position when said members are pushed together; said sidewalls extending substantially completely around said first and second members when these are separate pieces, and when said first and second members are hinged together along a contiguous section, at least the sidewalls opposite said contiguous section having the structure set forth.

3,851,790

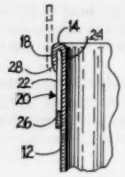
LITTER AND TRASH RECEPTACLES

Michael E. Kasper, 924 Delaware Ave., Olean, N.Y. 14760

Filed Feb. 26, 1973, Ser. No. 335,682

Int. Cl. B65d *25/22*

U.S. Cl. 220—85 R **5 Claims**



1. A litter receptacle, comprising;

a. an upper annular rim,

b. a side wall depending from said rim,

c. a bottom end fixed to said side wall,

d. means located adjacent said rim for affixing said receptacle to a support structure above ground level, and

e. means removably attached to said bottom end for supporting said means for affixing when removed and applied to a support structure.

3,851,791

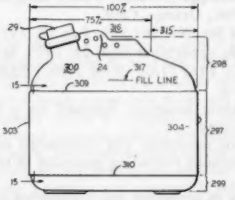
PLASTIC SAFETY CAN FOR CONTAINING FIRES BURNING INFLAMMABLE FLUID INSIDE THE CAN

Frank S. Flider, Chicago, Ill., assignor to Justrite Manufacturing Company, Chicago, Ill.

Continuation-in-part of Ser. No. 98,557, Dec. 16, 1970, abandoned, Continuation-in-part of Ser. No. 97,713, Dec. 14, 1970, Pat. No. 3,727,807, Continuation-in-part of Ser. No. 98,412, Dec. 15, 1970, abandoned, Continuation-in-part of Ser. No. 147,346, May 27, 1971, Pat. No. 3,754,691, Continuation-in-part of Ser. No. 151,354, June 9, 1971, Pat. No. 3,770,160, Continuation-in-part of Ser. No. 147,345, May 27, 1971, Pat. No. 3,729,122, Continuation-in-part of Ser. No. 147,522, May 27, 1971, Pat. No. 3,811,605, Continuation-in-part of Ser. No. 171,537, Aug. 13, 1971, Pat. No. 3,794,235, Continuation-in-part of Ser. No. 171,092, Aug. 12, 1971, Pat. No. 3,746,200. This application Oct. 10, 1972, Ser. No. 296,247

Int. Cl. B65d *25/00, 7/42*

U.S. Cl. 220—89 B **5 Claims**



1. An integral one piece container of high density polyethylene material having a completely and continuously closed

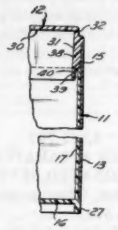
inner surface terminating in at least one opening, said container further including a cylindrical center section, a superimposed dome-shaped top section and a substantially rounded bottom section, said container having a width at least equal to its height, the cylindrical center section having a uniform wall thickness in the order of 0.150–0.200 inches, said superimposed dome-shaped top section and rounded bottom section having a wall thickness of approximately 10 percent less than said cylindrical section, said 10 percent difference in thickness between said cylindrical section and said dome-shaped top section and said rounded bottom section comprising a perimeter ledge with an angular offset of about 45° off the horizontal to effect a gradual transition in wall thickness.

3,851,792

CONTAINER

Robert W. Ankney, deceased, late of Walton Hills, Ohio (by Margaret G. Ankney, executrix), assignor to Weatherchem Corporation, Twinsbury, Ohio

Filed Aug. 14, 1972, Ser. No. 280,436
Int. Cl. B65d *41/00, 7/02, 7/24*
U.S. Cl. 220—253 **7 Claims**



1. A container comprising a receptacle, a cover, and a label, said receptacle and said cover each including longitudinally extending skirt portions, said skirt portions each being of polygonal configuration and having a plurality of rounded corners and a plurality of sides, said skirt portions being longitudinally telescopically connected so that said corners and sides of said cover skirt portion confront similarly disposed corners and sides of said receptacle skirt portion, said confronting corners of said skirt portions engaging one another with an interference fit to prevent lateral movement of said cover relative to said receptacle and to provide frictional resistance to longitudinal movement of said cover relative to said receptacle, said label extending between and being secured to said cover and said receptacle to prevent longitudinal movement of said cover relative to said receptacle said sides of the outer one of said skirt portions being substantially straight prior to assembly of said receptacle and cover, said sides of the inner one of said skirt portions being curved in a direction away from said confronting sides of said outer skirt portion convexly when viewed from the interior of said container prior to assembly of said receptacle and cover, whereby deflection of said inner sides upon assembly of said receptacle and cover is always in a direction away from said outer sides.

3,851,793

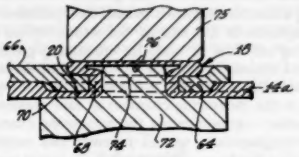
EASY OPENING CONTAINER WALL

Omar L. Brown, Dayton, Ohio, assignor to Ermal C. Fraze, Dayton, Ohio

Division of Ser. No. 464,909, June 18, 1965, Pat. No. 3,812,803, which is a continuation-in-part of Ser. No. 288,204, June 17, 1963, abandoned. This application May 7, 1973, Ser. No. 357,869
Int. Cl. B65d *17/20*
U.S. Cl. 220—270 **8 Claims**

1. In an easy opening container having a sheet metal wall weakened along a line of scoring to form a tear strip with a tab attached to the tear strip for manual severance thereof, the improvement comprising:

the sheet metal being thinned in a zone around the leading end of the tear strip, said zone being substantially wider



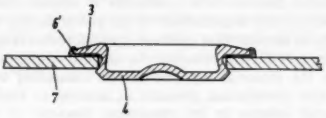
than the line of scoring, with the line of scoring extending into said zone to provide a residual web of metal along the line of scoring of minimum thickness at the leading end of the tear strip to facilitate initial severance of the tear strip at the leading end thereof.

3,851,794

AN EXPANSIBLE HOLEPLUG WITH SEAL

Klaus Friedrich Hehl, Norderstedt, Germany, assignor to ITW-ATECO G.m.b.H., Norderstedt, Germany

Continuation of Ser. No. 176,173, Aug. 30, 1971, abandoned. This application July 12, 1973, Ser. No. 378,469
Int. Cl. B65d *39/12*
U.S. Cl. 220—308 **1 Claim**



1. A hole plug with a fusible film characterized in that the hole plug includes a bottom wall conically inverted toward the head and provided at its middle with a bulged portion likewise inverted toward the head as well as an annular bead projecting outwardly from the collar in the vicinity of the bottom wall and that the fusible film is an annular disc the inner diameter of which is larger than the outer diameter of the collar, but is smaller than the outer diameter of the annular bead and the outer diameter of the fusible film is larger than that of the head of the hole plug, the head being substantially conical and thereby adapted to resiliently deform upon the expansion of the annular collar so that the head compresses the sealing film while said film fuses to the head and work panels.

3,851,795

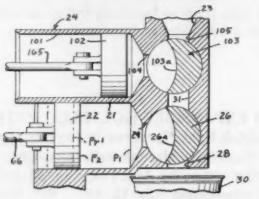
METHOD AND APPARATUS FOR DISPENSING SEMI-FLUID MATERIAL

Ralph F. Anderson, 332 Calvin Park Blvd., Rockford, Ill. 61107

Filed June 25, 1973, Ser. No. 372,972
Int. Cl. G01f *11/02*
U.S. Cl. 222—1 **23 Claims**

1. A method of dispensing successive generally gravimetrically uniform charges of semi-fluid material containing varying amounts of gaseous occlusions, from a supply source into atmospherically vented receivers, utilizing a volumetric type dispenser having a measuring chamber and a measuring piston movable in the chamber comprising cyclically: moving the measuring piston from an initial position in an intake stroke of preselected volumetric displacement to a second position to expand the volume of the measuring chamber from a first

preselected volume to a second preselected volume, feeding semi-fluid material containing gaseous occlusions from the supply source under pressure into the measuring cylinder during the intake stroke of the measuring piston and until the pressure on the material and gaseous occlusions in the measuring chamber reaches a preselected pressure of at least two atmospheres at the end of the intake stroke of the piston, shutting off flow of material containing gaseous occlusions into the measuring chamber at the end of the intake stroke of the piston and trapping the material and the gaseous occlusions in the measuring chamber at said preselected pressure, thereafter communicating the measuring chamber only with an atmospherically vented receiver and moving the piston through a discharge stroke back to its initial position whereby the volumetric expansion of the material containing gaseous occlusions in the measuring chamber, when the pressure on the material is decreased to atmospheric pressure, causes the



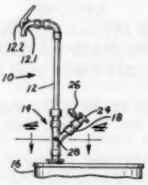
volume of material containing gaseous occlusions dispensed at atmospheric pressure into a receiver to exceed said preselected volumetric displacement of the piston during its intake stroke by an amount that increases and decreases respectively with increases and decreases in the amount of gaseous occlusions in the material supplied to the measuring chamber, setting said preselected pressure in relation to said second preselected volume in the measuring chamber so that the amount of material dispensed into a receiver due to said volumetric expansion of the material containing gaseous occlusions will approximately compensate for the gaseous occlusions in the material at atmospheric pressure, and repeating the cycle using the same initial position of the piston, the same preselected volumetric displacement of the piston in its intake stroke, and the same preselected pressure at the end of the intake stroke of the piston during each successive cycle to dispense successive generally gravimetrically uniform charges.

3,851,796

PRESSURE-ACTUATED DRUM DISPENSER

Ervin A. Moos, Minneapolis, Minn., assignor to Thexton Manufacturing Company, St. Louis Park, Minn.

Filed Nov. 19, 1973, Ser. No. 417,474
Int. Cl. B65d *83/14*
U.S. Cl. 222—39 **10 Claims**



1. A pressure-actuated drum dispenser mountable to an opening in the top of a storage drum and comprising;

an upright tubular housing mountable at its lower end to the drum opening and having an air entrance valve intermediate its ends communicating with the housing interior;

an upright discharge pipe extending through the housing and sealed to the upper end of the housing, the pipe being spaced inwardly of the housing to provide an annular space between the housing and the pipe which opens downwardly for communication with the interior of a drum;

a vent and access tube angled upwardly and outwardly at an oblique angle from the housing intermediate the housing ends and communicating with the annular space, the vent tube having a wide, exteriorly accessible mouth, a valve seat on the tube and spaced inwardly of the mouth, an air exit port between the mouth and the valve seat; and

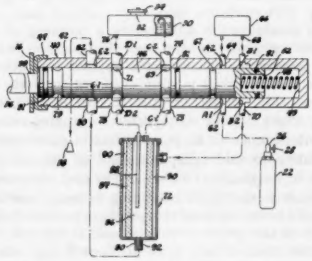
a pressure relief valve pre-set to open under a preselected pressure and including a cap having a spring-biased plug seatable against the valve seat and a cap attachment releasably attaching the cap to the mouth, the attachment having a closed position seating the plug under spring pressure against the valve seat and sealing the cap to the mouth, an open position permitting the cap and plug to be lifted from the mouth as a unit, and a position intermediate the open and closed positions wherein the plug is disengaged from the seat but the cap is retained on the mouth, the latter position permitting air under pressure to be safely bled from the drum through the air exit port while safely maintaining the cap on the mouth of the vent tube.

3,851,797

PORTABLE DISPENSER APPARATUS FOR PRODUCING A CARBONATED BEVERAGE

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1973, Ser. No. 412,865
Int. Cl. B67d *5/56*
U.S. Cl. 222—129.4 **3 Claims**



1. In a carbonated beverage dispenser, the combination comprising, a bottle for holding CO_2 gas under pressure, a regulating spool valve connected to said bottle, means for biasing the spool of said valve into an idle position, a first precharge chamber connected to said spool valve, a cooling reservoir tank containing a water-syrup liquid mixture connected to said spool valve, said tank positioned in said dispenser at an attitude adapted to allow a predetermined volume of the liquid mixture to drain therefrom into said first precharge chamber via said valve when said spool is biased in its idle position, a second precharge chamber connected to said spool valve; actuating means for moving said spool to an initial position whereby said spool valve connects said CO_2 bottle with said second precharge chamber allowing a measured quantity of CO_2 gas to expand from said bottle and occupy said second precharge chamber, said actuating means causing further movement of said spool whereby said spool valve connects said second precharge chamber with said first

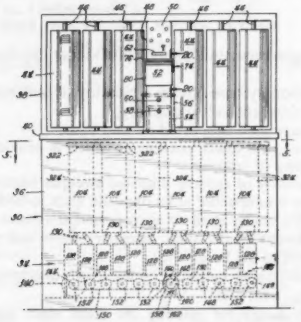
precharge chamber such that the liquid mixture in said first precharge chamber is carbonated by the flow of the predetermined volume of high pressure CO_2 gas from said second precharge chamber into said first precharge chamber, said actuating means causing further movement of said spool whereby said spool valve connects said first precharge chamber with a dispenser nozzle whereby a predetermined volume of carbonated liquid mixture is dispensed by said nozzle into a glass or the like.

3,851,798

AUTOMATIC COLORANT DISPENSER

Herbert L. Miller, Roselle, Ill., assignor to Miller Mfg. Co. of Schiller Park, Inc., Addison, Ill.

Filed Nov. 10, 1972, Ser. No. 305,255
Int. Cl. B67d *5/52*
U.S. Cl. 222—135 **14 Claims**



1. Apparatus for dispensing precisely measured volumes of liquid for intermixing with a base material comprising reservoir means for holding a supply of said liquid; a dispenser nozzle for discharging said liquid into said base material; metering pump means for pumping an adjustably selected metered volume of liquid from said reservoir means toward said nozzle for dispensing, said pump means including a pair of positive displacement pumping chambers having different displacement volumes; and a pair of independent drive mechanisms for selectively interconnecting and disconnecting said pumping chambers with a common rotary drive shaft for reciprocally activating each of said pumping chambers through a selectively adjustable number of displacement cycles.

3,851,799

VALVE FOR THE DISTRIBUTION UNDER PRESSURE OF A LIQUID OR PASTE PRODUCT

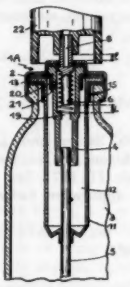
Jean-Claude Paoletti, Nanterre, France, assignor to Societe De Fabrication Et De Distribution De Parfumerie Et Cosmetique Diparco S.A., Neuilly-sur-Seine, France

Filed Apr. 16, 1970, Ser. No. 29,185
Claims priority, application France, Apr. 22, 1969, 69.12552; Nov. 7, 1969, 69.38372
Int. Cl. B65d *83/14*
U.S. Cl. 222—145 **20 Claims**

1. A valve system for the distribution under pressure of a product contained in a receptacle, composed of

a valve comprising: a capsule arranged to be fastened onto the receptacle; a body arranged to be set into the receptacle and having an upper part housed in the capsule; and a plunger tube extending with a lower end thereof to the bottom of the receptacle and serving for the removal of the product, said valve being of a type which distributes a product having a propellant mixed therewith,

said system being further composed of an adapter member detachably associated with said valve and comprising: means arranged to be supported by the receptacle and including a wall surrounding said body and partly defining with said body an elongated chamber for containing a propellant therein, said means having an upper portion including a flange which is dimensioned to be slidable into the interior of said capsule, and a lower portion formed as a sleeve forming a removably slidable sleeve



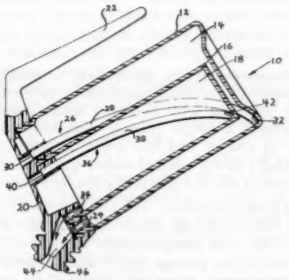
forming a seal with respect to said valve, said wall having an orifice formed therein; and a flap valve mounted to cooperate with said orifice, said flap valve opening in the direction from the interior of said chamber towardS the interior of said receptacle, the association of said adapter means with said valve resulting in a system for distributing a product contained in such receptacle under the action of a propellant maintained separate from said product and within said chamber.

3,851,800

PLURAL CHAMBERED, GRAVITY ORIENTED DISPENSER

Stephen C. Swain, Westport, Conn., assignor to Cambridge Research and Development Group, Westport, Conn.

Filed Aug. 20, 1973, Ser. No. 389,994
Int. Cl. B67d *5/60*
U.S. Cl. 222—145 **27 Claims**



1. A plural chambered, gravity oriented liquid dispenser comprising:

a first container means defining a first chamber which is adapted to contain a first liquid;

a first liquid discharge orifice means fluidly coupled to said first chamber;

a first air venting means having an inlet and an outlet with the outlet being positioned within said first chamber, said first air venting means outlet and said first liquid discharge orifice means defining a first air venting reference line;

a second container means defining a second chamber which is adapted to contain a second liquid;

a second liquid discharge orifice means fluidly coupled to said second chamber;

a second air venting means having an inlet and an outlet with the outlet being positioned within said second chamber, said second air venting means and said second liquid discharge orifice means defining a second air venting reference line; and,

means for securing said first and second containers with respect to each other so that said first and second air venting reference lines are parallel to each other in a plane.

3,851,801

DISPENSING DEVICE HAVING LOST MOTION PISTON PUMP

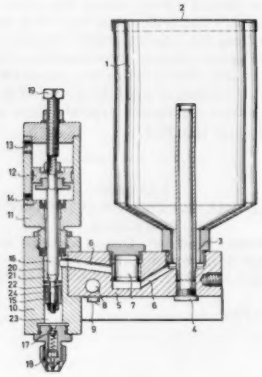
Oskar Roth, Zurich, Switzerland, assignor to Involvo AG, Verpackungsmachinen, Bunzen, Switzerland

Filed Feb. 11, 1972, Ser. No. 225,421

Claims priority, application Switzerland, Feb. 15, 1971, 2178/71

Int. Cl. B67d *5/40*

U.S. Cl. 222—146 HE **12 Claims**



1. A dispensing device, particularly for applying a bonding agent, comprising cylinder means having an elongated internal chamber provided with two end walls; dispensing nozzle means having a nozzle passage communicating with said chamber at one of said end walls; a piston rod extending longitudinally through said chamber; a piston surrounding said piston rod and slidable part of the distance between a first and a second position together with said piston rod and part of the distance relative to said piston rod, said piston dividing said chamber into two compartments located at opposite axial sides of the piston; passage means which is open and connects said compartments when said piston slides relative to said piston rod in one direction until said piston is in said first position, and closed when said piston rod and piston slide relative to one another in an opposite direction until said piston is in said second position; supply means communicating with said chamber intermediate said piston and the other of said end walls for supplying material to be dispensed; and valve means interposed in said nozzle passage, including a valve body responsive to the pressure of material resulting from movement of said piston toward said second position for opening said nozzle passage, and a biasing spring urging said valve body to normally close said passage.

3,851,802

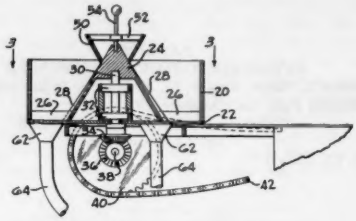
SINGLE CONE MULTIPLE-ROW PLOT SEEDER

Harold G. Marshall, Bellefonte, Pa., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 15, 1973, Ser. No. 416,304

Int. Cl. A01c *7/12*; **G01f** *11/24*

U.S. Cl. 222—162 **4 Claims**



1. A single cone, multiple row plot seeder distributor, comprising,

a. a stationary base having a plurality of uniformly spaced slots adjacent to its periphery;

b. a rotary shell supported on said base;

c. a cone, the lower portion of which is provided with a plurality of grooves;

d. a plurality of radially disposed sweeper blades, each of which is connected at its opposite ends to both the cone and the rotary shell so as to permit simultaneous rotary movement of the shell, sweeper blades and cone with respect to the base;

e. a seed hopper mounted on the upper ungrooved portion of the cone; and

f. drive means for rotating the cone, shell and sweeper blades.

3,851,803

SURE SPRAY FOR AEROSOL CAPS AND DISPENSERS

Hans Grothoff, 5891 Valbert, Auf der Hardt 20, Germany

Filed Mar. 21, 1972, Ser. No. 236,700

Claims priority, application Germany, Mar. 22, 1971, 2113781

Int. Cl. B67d *5/06*

U.S. Cl. 222—182 **14 Claims**

1. A tamperproof device of the type designed to be secured to a spray cap used on aerosol cans, said tamperproof device comprising: shield means removably mounted on the cap to partially enclose the button actuator protruding through the

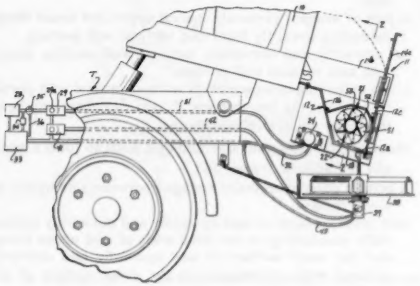
spray cap, said shield means configured and disposed in substantially overlying relation to a groove-like recess formed in the spray cap, said shield means comprising a first depending flange extending transversely to said groove-like recess and a second depending flange oriented in opposed spaced relation to said one flange and extending transversely to the length of said recess, said second flange extending into said recess to a spaced distance from the bottom thereof, thereby defining a finger hole, a cover member attached to the spray cap in overlying relation to said shield means and dimensioned and configured to engage both said shield means and the upper surface means and the upper surface of the spray cap whereby said shield means and cover member is temporarily removed from the spray cap during use of the aerosol can.

3,851,804

APPARATUS FOR FEEDING MATERIAL

Clas O. F. Fyrk, Rockford, Ill., assignor to Swenson Spreader & Mfg. Co., Lindenwood, Ill.

Filed June 15, 1972, Ser. No. 263,194
Int. Cl. G01f *11/24*
U.S. Cl. 222—413 **14 Claims**



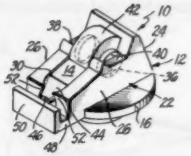
1. In an apparatus for feeding particulate material including a material supply hopper, an elongated trough having an open top material feed section communicating with said material supply hopper and a material metering section communicating with one end of said feed section and having a discharge outlet adjacent the end of the metering section remote from said feed section, an elongated material feed member including a shaft means extending along said metering section and said feed section and having feed vane means in said feed section for feeding material therealong to said metering section and metering vane means in said metering section for advancing a preselected amount of material along the metering section to the discharge outlet during each revolution of the shaft means, and means for rotating the shaft means in one direction, the improvement wherein said feed vane means comprises a plurality of individual feed blades each secured to said shaft means at spaced locations threalong and each having a feed face inclined at substantially the same acute angle to a radial plane through the shaft means to advance material along the feed section of the trough toward the metering section when the shaft means is rotated in said one direction, the plurality of feed blades having a uniform outer diameter and the spacing between the feed blades measured in a direction axially of the shaft means being less in the portion of the feed section adjacent the metering section when in the portion of the feed section remote from the metering section whereby the feed blades withdraw material from the supply hopper along the length of the feed section.

3,851,805

CHILD-RESISTANT CLOSURES WITH LIMITED SPOUT ACCESSIBILITY

Robert E. Hazard, North Kingstown, R.I., assignor to Polytop Corporation, Slatersville, R.I.

Filed Jan. 24, 1973, Ser. No. 326,425
Int. Cl. B65d *25/46, 47/06*
U.S. Cl. 222—534 **8 Claims**



1. In a dispensing closure having a cap adapted to be secured to a container and having a spout rotatably mounted on said cap so as to be capable of being rotated about an axis when said spout is physically engaged between a closed position in which said spout extends horizontally and seals off an opening through said cap and an open position in which said spout extends other than horizontally and is in alignment with said opening, the improvement which comprises:

two vertically extending walls located on said cap so as to extend vertically along and adjacent to both of the sides of said spout when said spout is in said closed position, said vertically extending walls surrounding the sides of said spout when said spout is in said closed position so that only the tip of said spout can be engaged to rotate said spout from said closed position to said open position,

a horizontally extending wall located on said cap so as to extend beneath the tip of said spout when said spout is in said closed position, said horizontally extending wall extending from the central part of said cap beyond the tip of said spout when said spout is in said closed position,

an end wall located on the extremity of said horizontally extending wall remote from the central part of said cap and extending upwardly from said horizontally extending wall so as to be aligned with the tip of said spout when said spout is in said closed position,

said horizontally extending wall and said end wall being located so as to cooperate to define a passage extending transversely of the tip of said spout, at least one end of said passage being open to provide access to an under portion of said tip of said spout when said spout is in said closed position,

said vertically and horizontally extending walls and said end wall serving to prevent said spout from being directly engaged by a finger when it is in said closed position so that said spout cannot be rotated from said closed position to said open position by a finger but serving to permit an under portion of said tip of said spout to be engaged by an extending implement inserted through an end of said passage so that a force can be applied beneath said tip when said spout is in said closed position to rotate said spout to said open position.

3,851,806

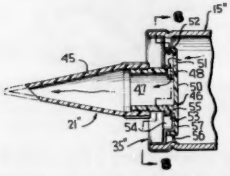
DISPENSER WITH NOZZLE CUT-OFF

Harry A. Peyser, Olympia Fields, and Herbert S. Ruekberg, Highland Park, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 2, 1973, Ser. No. 346,809
Int. Cl. B65d *47/00*
U.S. Cl. 222—555 **11 Claims**

1. A dispenser comprising a container body having axially opposite end portions between which is defined a container

interior, a closure at one of said end portions toward which material is moved incident to the performance of a dispensing operation, said closure includes a centrally disposed embossment projecting in a direction axially outwardly from the container interior, said embossment includes a peripheral wall and a terminal unapertured end wall, a radially opening aperture in said peripheral wall offset from the axis of said container body, a dispensing nozzle having its axis coincident with said container body axis, said dispensing nozzle having a first end remote from said embossment and a second end in external telescopic relationship thereto, a radially outwardly directed flange carried by said nozzle second end, means coop-



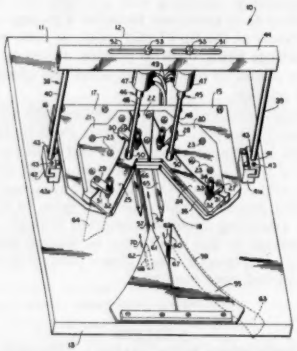
erative with said closure for sandwiching said flange therebetween for relative rotational movement of said nozzle relative to said closure between dispensing and nondispensing positions, said nozzle second end includes an axial passage radially outboard of and in communication with said peripheral wall aperture in said dispensing position, and said axial passage terminates at a position axially outboard of said unapertured end wall whereby in said dispensing position communication is established from the container interiorly radially outwardly through said peripheral wall aperture, axially outwardly through said axial passage to said position outboard of said unapertured end wall, and thereafter through the nozzle first end to atmosphere.

3,851,807

COLLAR FORM AND PRESS APPARATUS

Jack W. Fields, Vidalia, and Robert D. Camp, McRae, both of Ga., assignors to Oxford Industries, Inc., Atlanta, Ga.

Filed Feb. 12, 1974, Ser. No. 441,868
Int. Cl. A41h *43/00, 33/00*
U.S. Cl. 223—2 **7 Claims**



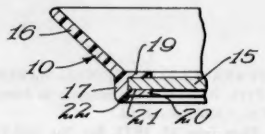
1. In apparatus for shaping collars or the like including a work table, a base plate mounted on said work table, collar shaping plates rigidly connected to said base plate, and a pair of collar presser plates movable toward and away from said base plate adjacent said shaping plates, the combination therewith of a frame mounted on said work table and extending over said base plate, a pair of rams supported by said frame, each ram including a ramrod movable toward and away from one of said presser plates, and spring means normally holding said presser plates away from said base plate, whereby said rams selectively urge said presser plates toward said base plate.

3,851,808

TRAY HAVING AN EXTRUDED EDGE

Paul K. Schilling, St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.

Filed Sept. 8, 1972, Ser. No. 287,498
Int. Cl. A47g *23/06*
U.S. Cl. 224—48 R **1 Claim**



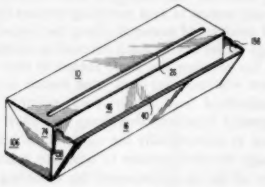
1. A tray including:
side and end walls formed of plastic and being of similar cross-sectional shape,
said walls being integral and including a vertical wall portion,
a pair of integral vertically spaced upper and lower flanges extending inwardly from said vertical wall portion,
an upwardly and outwardly inclined wall portion integral with said vertical wall portion,
a rim extending downwardly from said vertical wall portion throughout the length thereof, said rim extending below the lower surface of said flanges,
means connecting said side and end walls to form a generally rectangular frame, and
a bottom panel marginally engaged between said upper and lower flanges,
said inner surfaces of said upwardly and outwardly inclined walls terminating at the inner ends of said upper flanges and the outer surface of said upwardly and outwardly inclined walls terminating at the outer surface of said vertical wall portion.

3,851,809

SHEET MATERIAL DISPENSER AND BLANK FOR ASSEMBLING THE SAME

John M. McKibbin, Bridgewater, Conn., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Dec. 7, 1972, Ser. No. 312,905
Int. Cl. B26f *3/02*
U.S. Cl. 225—20 **6 Claims**



1. Dispensing carton for a supply roll of sheet material, said carton comprising
top wall means comprising panel means hinged at a rear edge and containing an elongated slot,
bottom wall means,
front wall means including panel means hinged at its bottom

to said bottom wall means and having a free edge at its top, and movable from a position substantially perpendicular to said bottom wall means to a position in obtuse angle relationship with said bottom wall means to space said free edge outward from the panel means of said top wall means,

cutter means associated with said free edge,

flap means associated with said front wall means,

means depending from a front edge of the panel means of said top wall means, movable by movement of the panel means of the top wall means at the hinge at its rear edge, to overlie and shield said cutter means when the panel means of said front wall means is in a position substantially perpendicular to said bottom wall means, and to interact with said flap means when the panel means of said front wall means is in a position in obtuse angle relationship with said bottom wall means to lock said front wall means in said relationship.

3,851,810

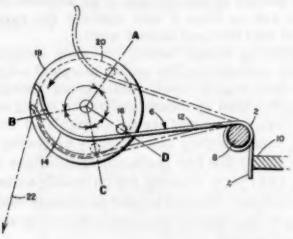
CONTOURED FEED SPRING

Paul W. Jespersen, Stamford, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Oct. 9, 1973, Ser. No. 404,135

Int. Cl. B65h *17/22*

U.S. Cl. 226—121 **5 Claims**



1. In a dispenser for flexible sheet material, said dispenser having a chassis and a rotatable feed roller for feeding said material out of the dispenser, said feed roller having a member mounted adjacent one end thereof, said member having a cam follower eccentrically mounted thereon, a drive spring comprising:

an intermediate portion anchored to said chassis;

a first outwardly extending portion integrally affixed to one end of said intermediate portion and abutting a portion of said chassis; and

a second outwardly extending portion integrally affixed to the opposite end of said intermediate portion and cooperating with said cam follower for deflection thereby during rotation of said feed roller and member, said second portion being configured to provide a decreasing moment against rotation of said feed roller while maintaining substantially constant deflection during a portion of said feed roller rotation.

3,851,811

APPARATUS FOR GUIDING THE EDGES OF WEBS IN PHOTOGRAPHIC COPYING APPARATUS OR THE LIKE

James Turner, London, England, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

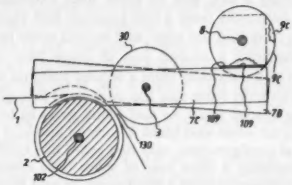
Filed Aug. 10, 1973, Ser. No. 387,782

Claims priority, application Germany, Sept. 12, 1972, 22446293

Int. Cl. B65h *23/28*

U.S. Cl. 226—199 **14 Claims**

1. In an apparatus for guiding the edges of elongated webs having different widths, particularly for guiding the edges of webs which constitute carriers for layers of photosensitive material and are moved lengthwise in a photographic copying apparatus, a combination comprising a plurality of pairs of guide members, the guide members of each of said pairs being movable between an inoperative position and an operative position in which latter position the guide members of the



respective pair are spaced apart a predetermined distance equal to or approximating one of said different widths and in which latter position the guide members of the respective pair define a path for and flank the edges of a web of corresponding width; and actuating means for moving selected pairs of guide members between said operative and inoperative positions.

3,851,812

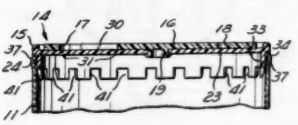
FORCE FIT PLASTIC CLOSURE

Patricia A. Bittel, Bay Village, Ohio, assignor to Weatherchem Corporation, Twinsburg, Ohio

Filed Jan. 21, 1974, Ser. No. 434,785

Int. Cl. B65d *3/16*

U.S. Cl. 229—5.5 **8 Claims**



1. A single piece integral plastic end closure for a tube comprising a laterally extending end portion, an annular skirt portion extending axially from said end portion, said skirt portion having a generally cylindrical outer surface for being received within said tube, and a cantilever fin having a fixed end on said outer surface of said skirt portion remote from said end portion and a free end, said fin being rotatable about said fixed end in one direction from a normal radially outwardly extending position to a mold ejecting position extending axially away from said end portion, and said fin being rotatable about said fixed end in another direction opposite said first direction from said normal radially outwardly extending position to a locking position extending axially toward said end portion.

3,851,813

GENERALLY FRUSTOCONICAL CONTAINER AND BLANK THEREFOR

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

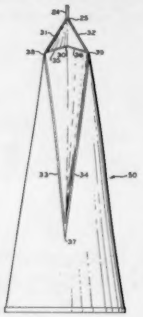
Filed Nov. 1, 1972, Ser. No. 302,879

Int. Cl. B65d *5/72*

U.S. Cl. 229—17 G **19 Claims**

1. A blank for forming the sidewall of a generally conical container, said blank having a top edge, a bottom edge opposite said top edge, and first and second opposite side edges, said bottom edge at least generally corresponding to the arc of a circle having a radius greater than the distance from said bottom edge to said top edge along a radial ray of said circle, said first side edge extending at least substantially along a first radial ray of said circle, said second side edge extending at least substantially along a second radial ray of said circle, at least one of said first and second side edges having a marginal portion extending along the length thereof lying outside the

respective one of the first and second radial rays to provide a seam margin along one of said side edges for overlapping and bonding to the margin along the other of said side edges in the formation of said blank into a generally frustoconical configuration; first and second pinched waist forming score line configurations formed in said blank; said first score line configuration comprising a first pair of score lines extending downwardly and outwardly from a first point on said blank spaced downwardly from said top edge; said second score line configuration comprising a second pair of score lines extending downwardly and outwardly from a second point on said blank spaced downwardly from said top edge, said first and second points being spaced apart on said blank so as to be substantially 180° apart when said blank is formed into said generally frustoconical configuration; said first score line configuration further comprising a third pair of score lines extending upwardly and outwardly from a third point on said blank spaced from said bottom edge to points of intersection with said first pair of score lines to form a first tetragon with said first pair of score lines, said first pair of score lines being at least substantially equal to each other and said third pair of score lines being at least substantially equal to each other, said first and



third points being at least subatantially on a first common radial ray of said circle with said first tetragon being at least substantially symmetrical about said first common radial ray; said second score line configuration further comprising a fourth pair of score lines extending upwardly and outwardly from a fourth point on said blank spaced from said bottom edge to points of intersection with said second pair of score lines to form a second tetragon with said second pair of score lines, said second pair of score lines being at least substantially equal to each other and said fourth pair of score lines being at least substantially equal to each other, said second and fourth points being at least substantially on a second common radial ray of said circle with said second tetragon being at least substantially symmetrical about said second common radial ray, the angle between said first aand second common radial rays being such that said first and second common radial rays would be substantially 180° apart when said blank is formed into said generally frustoconical configuration; a first score line extending between the points of intersection of said first pair of score lines with said third pair of score lines; and a second score line extending between the points of intersection of said second pair of score lines with said fourth pair of score lines.

3,851,814

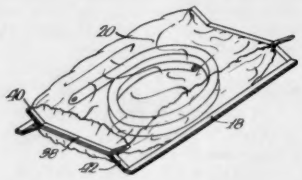
GUSSETED ARTICLE

Leo J. Stage, Roselle Park, N.J., assignor to Arvey Corporation, Chicago, Ill.

Filed Feb. 28, 1972, Ser. No. 229,981
Int. Cl. B65d *31/10*
U.S. Cl. 229—53 **5 Claims**

1. A gusseted article formed from two webs of material interconnected along coterminous marginal edges comprising a first web of material having a transverse dimension greater than the second web of material; said first web of material comprising a non-heat sealable film having first and second spaced parallel fold lines adjacent each marginal edge to produce a first inwardly extending portion and a second outwardly extending portion having a transverse dimension greater than the transverse dimension of the first portion whereby a gusset is formed in said first web of material adjacent each marginal edge thereof with an outer area of each second portion extending outwardly beyond the adjacent first fold line whereby the outer area of each second portion is exposed at the marginal edges of said first web;

means for adhering said first web of material to said second web of material including means sealing the exposed



outer area of the second portions of the first web along at least a portion of their length to an adjacent area of the second web to form a seal adjacent the two marginal edges of said first and second webs,

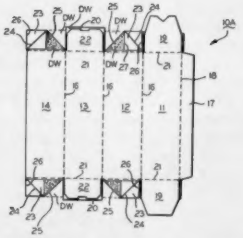
said adhering means further including closure forming means intersecting the sealed marginal edges of said first and second webs, said closure forming means being provided by means sealing the facing surfaces of said first and second webs between said second fold lines, means sealing said inwardly extending first portions of said first film to the adjacent surface of the first film, and means securing the outwardly extending second film, said first and second portions of said first web being in overlapped, unsealed relationship with respect to one another.

3,851,815

FOLDED PRE-WRAP CARTON

John D. Desmond, and Joseph I. Hart, both of Philadelphia, Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Dec. 21, 1973, Ser. No. 427,123
Int. Cl. B65d *65/00*
U.S. Cl. 229—87 R **2 Claims**



1. In a carton having a decorative wrap secured thereto and constructed and arranged in appearance when set up to simulate a carton which is hand wrapped with a detached decorative wrap, said carton being formed from a cut and scored blank of paperboard or the like having the decorative wrap loosely secured thereto and comprising:

a. opposed main and side panels foldably interconnected to define a carton tube of rectangular cross section;

b. inner and outer closure flaps foldably extending from said main panels and folded into closing position at right angles into the plane of the end of said tube;

i. said outer closure flap overlapping said inner closure flap and having the distal edge thereof extending approximately to a median line between said opposed main panels;

c. right trapezoid-shaped closure flaps extending foldably from said side panels and having their right angled sides in proximate relationship and with said first closure flap extending therebetween;

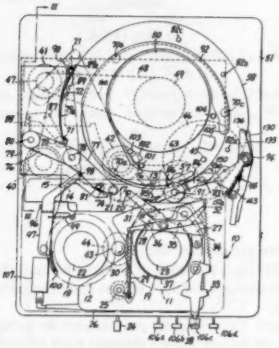
i. a score line in each of said last named flaps extending from a point adjacent the intersection of the distal edge thereof with the inclined edge thereof to the fold line at the end of the right angle to said fold line;

d. each of said trapezoidal flaps being folded into confronting relationship at said score line to provide a flap portion of double thickness having a free edge of single thickness at right angle to said fold line.

3,851,816
AUTOMATIC TAPE LOADING TYPE RECORDING AND/OR REPRODUCING APPARATUS HAVING A PINCH ROLLER ACTUATING DEVICE

Hiroshi Katoh, Yokohama-City, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Kanagawa-ken, Japan

Filed July 18, 1973, Ser. No. 380,342
Claims priority, application Japan, July 21, 1972, 47-72549
Int. Cl. G11b *17/02*
U.S. Cl. 226—91 **4 Claims**



1. Automatic tape loading type recording and/or reproducing apparatus comprising loading means for drawing a tapeform of recording medium out of a tape housing structure and loading the same along a specific tape path, moving means for moving said loading means from a disengaged position to an operative position and for returning the same from the operative position to the disengaged position, a capstan means and pinch roller means disposed along the specific tape path, pinch roller actuating means responsive to the arrival of said loading means at the operative position for pressing said pinch roller against said capstan with the recording medium interposed therebetween to move the recording medium along the specific tape path, and means for recording and/or reproducing from the recording medium moving along the specific tape path signals, said pinch roller actuating means comprising:

a. a solenoid having a plunger rod, one end of which is provided with a pin;

b. a lever member engaging the pin of the solenoid plunger, said lever member being pivoted on a pivot pin;

c. a pressing member swingable between first and second positions, at the first position said pressing member being spaced apart from the pinch roller which is spaced apart from said capstan and releasably engaging the pin of the plunger rod in an unenergized state of said solenoid, at the second position the pressing member pressing the pinch roller against said capstan with the recording medium interposed therebetween;

d. pushing means for releasing said pressing member from engagement with the pin of the plunger rod and moving said pressing member from the first position toward the second position to contact and move the pinch roller toward said capstan, as said loading means moves from the disengaged position toward the operative position;

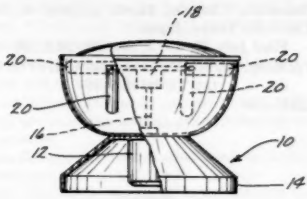
e. energizing means responsive to the arrival of said loading means at the operative position for energizing said solenoid to pull the plunger rod and rotate said lever member about the pivot pin whereby said pressing member is impacted by the pin of the moving plunger rod and engaged by the pin of the plunger rod so as to swing to the second position;

f. locking means responsive to the rotation of said lever member by said energizing means for locking said pressing member at the second position and holding the pinch roller pressed against said capstan while said loading means lies on the operative position.

3,851,817
METHOD AND MEANS FOR CENTRIFUGING CHILLED BLOOD SAMPLES

Eleanor S. Buck, 726 50th St., Des Moines, Iowa 50312

Filed May 29, 1973, Ser. No. 364,954
Int. Cl. B04b *15/02*
U.S. Cl. 233—11 **5 Claims**



1. In combination,

a centrifuge device having at least one supporting means secured to a rotating member and being adapted to support a receptacle during rotation of said supporting means,

a receptacle holder element on said supporting means, said holder element comprising inner and outer walls having a space therebetween,

a refrigerant material in said space between said wall members,

said refrigerant material and said holder element adapted to be chilled,

and a receptacle in said holder element containing a test specimen of liquid to be centrifuged, the walls of said receptacle being in close proximity to the inner wall of said holder element so as to permit the refrigerant material to reduce the ambient temperature of said test specimen.

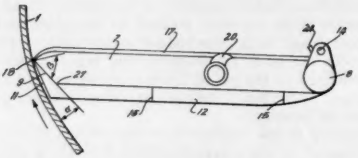
3,851,818
APPARATUS FOR DISCHARGING THE CONTENTS OF A DISCONTINUOUSLY OPERATING CENTRIFUGE

Kurt Pause, Grevenbroich; Ernst Ullrich Dregger, Neuss, and Gottfried Otten, Grevenbroich, all of Germany, assignors to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Germany

Filed Apr. 23, 1973, Ser. No. 353,720
Int. Cl. B04b *11/08*
U.S. Cl. 233—22 **7 Claims**

1. In a discontinuously operating centrifuge, having a drum provided in an upper axial end with an opening, an arrange-

ment for discharging the contents of the drum comprising, in combination, a suction conduit mounted for insertion into and removal from the drum through said opening, and for pivotal displacement within the drum between an operative position and an inoperative position, said suction conduit having a nozzle portion provided with an inlet opening arranged to be



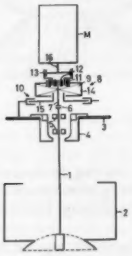
located closely adjacent to an inner circumferential surface of the circumferential wall of said drum and to face opposite the direction of rotation of the drum, the plane of said inlet opening defining, when said conduit is so located, with a tangent to the circumferential wall of the drum a first acute angle, and with the drum radius a second acute angle which is greater than said first acute angle.

3,851,819

DRIVING DEVICE FOR ROTARY CHEMICAL MACHINE

Takaya Tadokoro, Chibashi, Japan, assignor to Tsukishima Kikai Co., Ltd., Tokyo, Japan

Filed July 27, 1973, Ser. No. 383,180
Claims priority, application Japan, July 28, 1972, 48-75596
Int. Cl. B04b *9/10*
U.S. Cl. 233—24 **9 Claims**



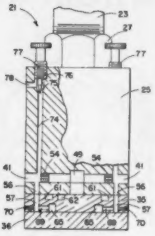
1. A driving device for a rotary chemical machine having a normally and reversely rotatable rotary basket and a rotary shaft affixed to the rotary basket, comprising a reversible prime motor having a cylindrical hollow input shaft driven thereby, an output shaft secured to said rotary shaft, a rotary casing rotatably mounted around said output shaft, a first unidirectional clutch interposed between the input shaft of said prime motor and said rotary casing for coupling the input shaft of said prime motor to said rotary casing when the input shaft rotates in one direction, a second unidirectional clutch interposed between the input shaft of said prime motor and said output shaft secured through the rotary shaft to said rotary basket for coupling the input shaft to said output shaft when the input shaft rotates in the other direction, a reduction gear mechanism contained in said rotary casing and having a first sun gear integrally formed on said output shaft, a sleeve shaft rotatably mounted on said output shaft coaxially adjacent to the sun gear and having a second sun gear integrally formed thereon adjacent to said first sun gear, and further having one end thereof projected externally from said rotary casing, a stub shaft so mounted around said output shaft, so as to be rotatable about its own axis and also around said output shaft within said rotary casing, first and second idle planetary gears rotatably mounted on said stub shaft and engaged with said first sun gear and second sun gear respectively and driven separately from said rotary casing only when said input shaft of said prime motor is rotated in one direction, a torque control mechanism having a non-restricting element affixed to the projected end of said sleeve shaft, at least one pair of braking elements movable relative to each other toward or away from both surfaces of said non-restricting element, braking element drive control means including a dual-operated air cylinder for actuative said braking elements, control means including a solenoid valve for controlling the quantity of air supplied to said air cylinder and a control circuit for controlling the opening of said solenoid valve and having an electric motor load detector for detecting the amplitude of the load current of said prime motor, a control for urging said braking elements into engagement with said non-restricting element by a desired force, and a control calculator for comparing the detected value detected by said load detector with a preset value preset by said control for producing the output responsive thereto for controlling the actuation of said braking elements so as to impart a desired torque to said output shaft.

3,851,820

SPRAY GUN FOR PRODUCING A FAN-LIKE PATTERN

Truman O. Hudson, 3205 Oakwood, Lynwood, Calif. 90262

Filed Feb. 28, 1974, Ser. No. 446,720
Int. Cl. B22d *17/22*
U.S. Cl. 239—407 **11 Claims**



1. A spray gun comprising:
a body having a plurality of orifices formed therein;
said body having first duct means communicating with each orifice;
first means for supplying pressurized air to said first duct means so that air passes through each of said orifices and exists said body;
a bushing having a central aperture disposed within each one of said orifices, spaced inward from the opening thereof so that a Venturi effect is produced by the air passing therethrough;
said body having a second duct means communicating with each orifice in the region between said bushing and the opening thereof;
second means for supplying liquid to said second duct means so that the liquid therein mixes with the air passing through each of said bushings in each of said orifices.

3,851,821

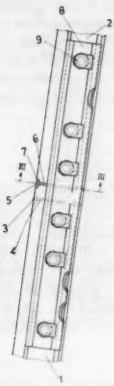
RAIL JOINT

Jose Juncosa Lopez, Po de la Habana No. 80, Madrid, Spain

Filed Jan. 17, 1973, Ser. No. 324,519
Claims priority, application Spain, Jan. 21, 1972, 181885
Int. Cl. E01b *11/00*
U.S. Cl. 238—230 **5 Claims**

1. A rail joint comprising a pair of juxtaposed rail ends each having an upper running surface and an outer side face, a cutout extending from an end face of each rail into the latter and being defined by a face parallel to a longitudinal plane of symmetry of the rail, and a second face transverse thereto, said first faces of the pair of rail ends abut against each other,

said second faces being parallel and spaced apart, and further comprising plane triangular shaped truncations respectively extending from said end face and said second face of each rail



obliquely along a line parallel to the longitudinal axis of said rail, and tapering to substantially a point on the intersection of the running surface with the outer side face of the respective rail.

3,851,822

METHOD FOR DEFOGGING A ROADWAY, LANDING STRIP OR THE LIKE

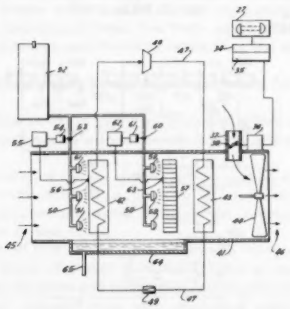
Anton Pocrnja, and Heribeft Wenzel, both of Munich, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed May 16, 1973, Ser. No. 360,909

Claims priority, application Germany, May 19, 1972, 2224657; May 19, 1972, 2224671; May 19, 1972, 2224672

Int. Cl. E01h *13/00*

U.S. Cl. 239—2 R **7 Claims**



1. A method of defogging an elongated region comprising the steps of:

directing jets of air across said region from opposite longitudinal sides thereof including, a windward and leeward side, and at spaced apart locations along said sides;

dehumidifying at least some of said jets of air;

maintaining the strength of jets generally counter to the wind direction greater than jets generally in the wind direction;

orienting at least one jet on each side generally parallel to the wind direction; and

orienting jets on either side of said one jet at increasing angles to the wind direction away from said one jet.

3,851,823

BURNER WITH ULTRASONIC VIBRATOR

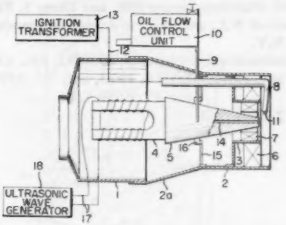
Makoto Hori, Nara; Nerumitsu Rokudo, and Toshiyuki Ishiguro, both of Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka-fu, Japan

Filed June 26, 1973, Ser. No. 373,685

Claims priority, application Japan, July 4, 1972, 47-67338; July 4, 1972, 47-67390; July 19, 1972, 47-72798; July 28, 1972, 47-76172

Int. Cl. B05b *17/06*

U.S. Cl. 239—102 **9 Claims**



1. A burner with an ultrasonic vibrator comprising

a. a casing and an outer duct fixed to said casing,

b. a frustoconical hollow horn for atomizing liquid fuel disposed within said outer duct coaxially thereof and coupled to an ultrasonic vibrator,

c. means for supplying liquid fuel to a fuel port opened at the front end of said hollow horn,

d. an inner diffuser disposed coaxially of said hollow horn so as to surround the leading portion thereof in spaced apart relation,

e. an outer diffuser disposed coaxially and outwardly of said inner diffuser,

f. an inner duct separating said inner diffuser from said outer diffuser,

g. the front end of said inner diffuser being within the front ends of said outer diffuser and of said hollow hone,

h. the front end of said hollow horn being within the front end of said outer diffuser, and

i. said inner duct surrounding both the outer periphery of said inner diffuser and the inner periphery of said outer diffuser.

3,851,824

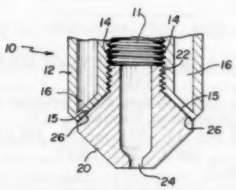
NOZZLE FOR PLASMA WELDING TORCH

Orvar Anders Svensson, Taby, Sweden, assignor to AGA Aktiebolog, Lidingo, Sweden

Filed Mar. 21, 1973, Ser. No. 343,222

Int. Cl. B05b *15/00*

U.S. Cl. 239—132.3 **8 Claims**



1. A nozzle assembly for use with a plasma torch, comprising a threaded nozzle holder; a conical contact surface on said holder; means for cooling the assembly, disposed within said holder; a threaded nozzle and a conical contact surface thereon, adapted to rest against said conical contact surface

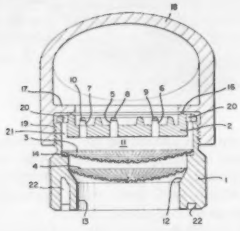
on said holder, when said nozzle is threadably engaged in and thereby pressed against said holder, the angle of slope of the conical surface of said nozzle or holder against the longitudinal axis of the torch in which said assembly is disposed and the diameter (D) and length (1) of the threaded portion being chosen so, that the quotient of the radial and the axial movement of a surface element on said conical surface during heating up is always greater than the tangent of the angle of slope (β) of said conical surface.

3,851,825

LEAK-PROOF LAMINAR FLOW DEVICE

Richard G. Parkison, Somerville, and Barry S. Fichter, Dunellen, both of N.J., assignors to American Standard Inc., New York, N.Y.

Continuation-in-part of Ser. No. 332,982, Feb. 15, 1973,. This application May 14, 1973, Ser. No. 359,948
Int. Cl. B05b *1/14*
U.S. Cl. 239—590.3 **10 Claims**



1. A non-aerated device for attachment to a spout or faucet for converting the water randomly flowing through the spout or faucet into a single laminar stream substantially free of air, said device comprising a disk having a plurality of substantially equal parallel jet-forming perforations therein parallel to the axis of said device, said disk including means overhanging said perforations for causing the water flowing through said perforations to diverge so that the water jets are divergent in form as they exit from said perforations, said disk also having peripheral openings for receiving water which does not flow through said perforations; and a plurality of screens positioned downstream from said disk and forming a region of sub-atmospheric pressure between said disk and said screens, the screen nearest said disk having a mesh which is coarser than the screen farthest from said disk, and said screens being of spherical or concaval shapes bulging toward the downstream direction in said device, said device being further arranged so that water which passes through said peripheral openings in said disk is drawn into said region of sub-atmospheric pressure and is there joined with said water jets exiting from said perforations in said disk, and said device having its smallest internal cross-sectional area at its discharge end.

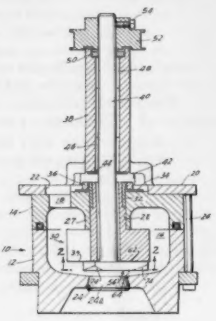
3,851,826

APPARATUS FOR TREATMENT OF SOLIDS FOR ANALYSIS

I. Lee Perlman, Pound Ridge, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Sept. 13, 1973, Ser. No. 396,925
Int. Cl. B02c *18/10*
U.S. Cl. 241—46.11 **10 Claims**

1. Apparatus for mixing solid sample material in a carrier liquid for analysis, comprising: a first cutter element, a second cutter element, said first cutter element being driven relatively to said second cutter element about a rotary axis for a shearing action between said cutter elements which are engageable with one another, and means mounting said first cutter element for floating movement toward and away from said second cutter element, each of said cutter elements having on one face thereof plural knife edges in array about said axis, said first cutter element having means thereon to shift said first cutter element to gap-closing relationship with said first



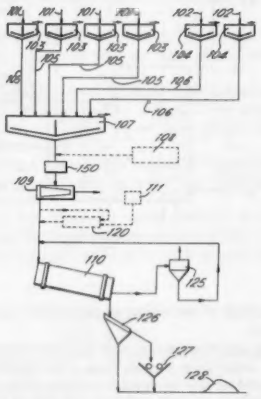
element and maintain such relationship during operation of such apparatus for mixing and to move in a direction away from said second cutter element upon termination of such operation.

3,851,827

METHOD AND DEVICE FOR TRANSFORMING SLURRIES COMING FROM WET PURIFICATION PLANTS FOR FUMES FROM BLAST FURNACES AND BASIC OXYGEN FURNACES INTO A CONTROLLED SIZE GRANULAR SOLID MATERIAL

Milvio Carignani, Tarranto; Michele Conti, Genoa-Quarto; Casimiro Dufour-Berte; Geremia Rossi, both of Genoa; Edoardo Pasero, Rome, and Hermann Zmolnig, Genoa, all of Italy, assignors to Italsider S.p.A., Genova, Italy

Division of Ser. No. 69,054, Sept. 2, 1970, Pat. No. 3,770,415. This application July 19, 1973, Ser. No. 380,931
Claims priority, application Italy, Sept. 10, 1969, 7304/69
Int. Cl. B02c *21/00*
U.S. Cl. 241—65 **11 Claims**



1. Apparatus for obtaining from a first slurry coming from a wet purification plant of a blast furnace and a second slurry coming from a wet purification plant of a basic oxygen furnace, a granular solid material of controlled size which is reusable in a blast furnace, said apparatus comprising: at least

one decantation tank for receiving slurries coming from the wet purification devices of the basic oxygen furnace and the blast furnace; a dehydrating device; a drying-granulating device means for passing hot fumes through said drying-granulating device; a sieve for separating the granular material of the desired size, and means for recycling the granules passed through the sieve to an inlet of the drying-granulating device, and means for grinding the granular material of excessive size coming from said drying-granulating device.

3,851,828

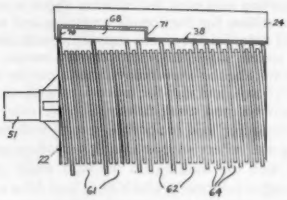
MACHINE FOR PROCESSING BONE-IN MEAT CUTS

Stephen A. Paoli, Stephen Paoli Manufacturing Company, 520 Sixth St., Rockford, Ill. 61108

Filed Jan. 22, 1973, Ser. No. 325,825

Int. Cl. A22c *17/00, 25/16;* **B02c** *18/00*

U.S. Cl. 241—68 **12 Claims**



1. A machine for processing bone-in cuts of meat, poultry or fish in one continuous operation which includes reducing said material to a coarse agglomeration of fragmented hard and soft tissues while simultaneously separating therefrom boneless comminuted meat free from perceptible bone and other hard tissues, said machine comprising the combination of:

a. a machine casing having a feeding opening for raw material;

b. a hollow power driven rotor journaled within said casing, said rotor having a driven or inboard end and an outboard end;

c. a plurality of axially spaced helical cutting elements in said rotor defining a plurality of constricted helical grooves communicating between the exterior and the interior of said rotor;

d. certain of said helical cutting elements being of substantially larger diameter than the remaining ones of said cutting elements and being disposed in graduated spaced relation on said rotor with graduated width pressure pockets defined therebetween;

e. a pressure bar fixed to said casing in closely spaced relation with the outer peripheral surface of said rotor;

f. a regulator place fixed to said pressure bar and extending upwardly therefrom in closely spaced nested relation with the outer peripheral surface of said rotor;

g. means defining a generally arcuate pocket in said regulator plate adjacent said feeding opening;

h. an arcuate abutment on the side of said pocket toward the outboard end of said rotor;

i. said abutment being constructed and arranged to coact with said larger diameter helical cutting elements and the pressure pockets therebetween to break said raw material into an agglomeration of hard and soft tissues while comminuted meat is being separated therefrom.

3,851,829

DEVICE FOR CRUSHING SOLID MATERIALS

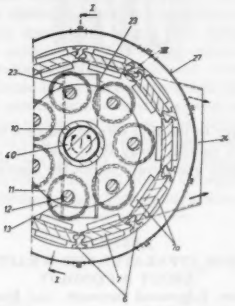
Walter Dopper, Kassel; Dietrich Hausler, Ahnatal-Weimar, and Walter Kohler, Kassel, all of Germany, assignors to Rheinstahl Aktiengesellschaft, Essen, Germany

Filed Sept. 27, 1973, Ser. No. 401,342

Claims priority, application Germany, Jan. 19, 1973, 2302446

Int. Cl. B02c *13/282*

U.S. Cl. 241—188 R **10 Claims**



1. In an apparatus for physically reducing material; a housing substantially circular in cross section disposed on a vertical axis, axial wear plates distributed circumferentially inside said housing and forming the radially inner wall thereof, an axial corner extending along at least one circumferential edge of each wear plate, profiled carrier members on the housing interposed between and extending axially along said wear plates, interfitting elements of key means on the sides of said carrier members and the edges of said wear plates for supporting said wear plates in said housing, a rotor in the housing rotatable on the axis of the housing, and axially spaced rows of circumferentially spaced disc-like beating members on said rotor, means supporting each beating member for rotation on a vertical axis on the rotor, each beating member having a profiled peripheral portion protruding radially from the rotor, the radial gap between the radially inner wall of said housing and the periphery of each said row of beating members decreasing in the downward direction.

3,851,830

METHOD FOR WINDING ELECTRIC COILS AND ELECTRIC COILS PRODUCED THEREBY

Maurice Barthalon, Tournepierre Avenue des Sapins, Verrieres Le Buisson, Essonne, France

Filed Apr. 24, 1973, Ser. No. 353,958

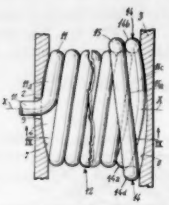
Claims priority, application France, Apr. 25, 1972, 72.14619

Int. Cl. H01f *41/04, 27/28;* **B65h** *75/14*

U.S. Cl. 242—7.03 **20 Claims**

1. A method of winding electric coils having closely packed turns on a former having a tubular body and a pair of spaced-apart flanges on the body between which the coil is wound, the body of the former having a substantially flat crossing face defined between substantially straight spaced-apart lines of intersection between the surface of the body and angularly related radial-axial planes of the body, each flange having a concavity on its inwardly facing surface the edges of which are defined by lines of intersection between the inner, flat surface of the flange which is substantially perpendicular of the axis of the tubular body, comprising the steps of maintaining each turn of the wire in each layer of the coil substantially in a plane perpendicular to the axis of the body of the former in all portions of such turn except that portion which overlies the crossing face, displacing each full turn in each layer a prede-

termined pitch distance in a direction parallel to the axis of the body substantially exclusively in said portion thereof which overlies the crossing face, and advancing the wire from the last



turn of one layer to the first turn of the next following layer by displacing it radially away from said axis of the tubular body substantially exclusively within the concavity of one of the flanges.

3,851,831

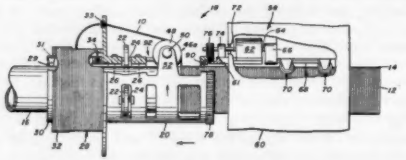
METHOD AND APPARATUS FOR WRAPPING WIRE ABOUT A CONDUIT

John E. Steiner, Edgewood Borough, and Donald N. Volk, Irwin Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 27, 1972, Ser. No. 248,061

Int. Cl. B65h *81/06*

U.S. Cl. 242—7.22 **24 Claims**



1. A wire wrapping apparatus for wrapping high-strength wire, anchored at its free end to a predetermined point on a conduit, under a predetermined tension and pitch about said conduit, said apparatus having:

a. a spinning head disposed about said conduit in engagement with said conduit for relative rotating and longitudinal movement with respect to said conduit and for wrapping said wire on said conduit with said predetermined tension and pitch;

b. wire supply means either disposed about said conduit in engagement with said conduit for relative rotating and longitudinal movement with respect to said conduit, or mounted on said spinning head and for supplying said wire to said spinning head;

c. friction means associated with said wire supply means for providing a friction drag on said wire supply means to prevent uncontrolled payoff of said wire from said wire supply means;

d. wire tensioning means mounted on said spinning head and adapted to receive said wire from said wire supply means at a low first tension, to store a plurality of turns of said wire on said wire tensioning means, and to wrap said wire predetermined a higher second tension on said conduit from said redetermined point during the relative rotating and longitudinal movement of said spinning head with respect to said conduit; and

e. drive means connected to one member of said spinning head and said conduit for causing relative rotating and longitudinal movement of said one member with respect to the other member of said spinning head and said conduit.

3,851,832

WINDING APPARATUS FOR A WEB

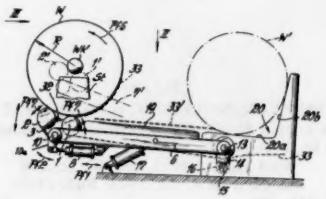
Walter Krueckels, Hausen, and Markus Ruescher, Schofnau, both of Germany, assignors to Maschinenfabrik Zell J. Krueckels KG, Zell, Germany

Filed Oct. 16, 1972, Ser. No. 297,989

Claims priority, application Germany, Oct. 16, 1971, 2151615

Int. Cl. B65h *17/08*

U.S. Cl. 242—66 **16 Claims**



1. Winding apparatus for a web comprising a core; bearing means supporting said core for rotation about a core axis; a pair of drive rollers for frictionally engaging and winding up a web on said core; carrier means supporting said drive rollers; supporting means supporting said carrier means with said drive rollers for angular movement about a carrier axis parallel to said core axis, and also for movement with said supporting means toward and away from said core axis; operating means for displacing said supporting means with said carrier means and drive rollers so that said drive rollers are pressed against the web for winding up the web while said carrier means assumes a position in which both said drive rollers abut the web being wound up, irrespective of the diameter of the wound up web roll.

3,851,833

REEL MOUNTINGS

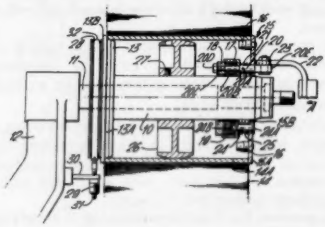
Norman Walter Jackson, London, England, assignor to Molins Limited, London, England

Filed Dec. 20, 1972, Ser. No. 322,899

Claims priority, application Great Britain, Dec. 21, 1971, 59602/71

Int. Cl. B65h *17/02*

U.S. Cl. 242—68.3 **9 Claims**



1. A mounting for a reel having a central aperture, comprising a shaft to pass through the center of the reel and having a first supporting means to receive and position one end of the reel, and a second supporting means to receive and position the other end of the reel, the second supporting means being detachable from the shaft and comprising a plate to support said other end of the reel, a rubber ring closely encircling the shaft and positioned between the first supporting means and the plate, and actuating means operable to effect relative movement between the plate and the ring to bring the plate and the ring together, the actuating means comprising com-

pression means bearing against the side of the ring remote from the plate and extending through the plate, a cam pivotal about said compression means to engage the plate and cause said relative movement between the plate and the ring, and resilient means interposed between the plate and the other side of the ring so that pivoting of the cam causes axial compression of the ring between said resilient means and said compression means, resulting in the ring gripping the shaft and the plate being urged towards the ring to clamp the reel against the first supporting means.

3,851,834

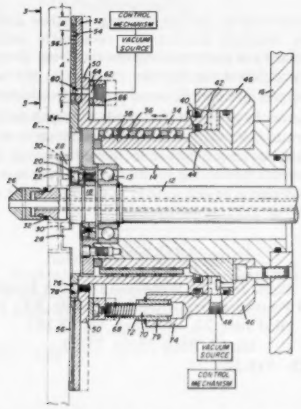
ROLL DRIVE MECHANISM

Neil S. White, Rochester; Donald R. Mansfield, Bloomfield, and Noel H. Matthews, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 8, 1973, Ser. No. 339,464

Int. Cl. B65h *19/02*

U.S. Cl. 242—68.3 **15 Claims**



1. In a drive mechanism for a roll of web material, the combination comprising:

primary drive means drivingly coupled to said roll for driving said roll of material; and

secondary drive means drivingly coupled intermittently to said roll and to said primary drive means, said secondary drive means being movable between a retracted position, in which said secondary drive means is drivingly uncoupled from said roll of material and said primary drive means, and a roll engaged position, in which said secondary drive means is drivingly coupled to said roll of material and to said primary drive means and is responsive to said primary drive means for driving said roll of material.

3,851,835

WINDING-UP DEVICE WITH AUTOMATIC LOCK FOR SAFETY BELT

Artur Fohl, Schelmenwasenstr. 68, 7061 Haubersbronn, Germany

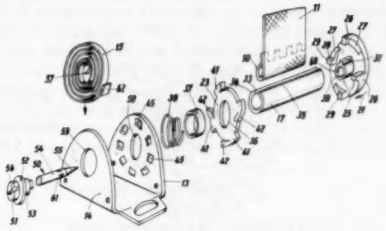
Filed May 3, 1972, Ser. No. 250,010

Claims priority, application Germany, May 5, 1971, 2122419; Dec. 22, 1971, 2163732

Int. Cl. B65h *75/48*

U.S. Cl. 242—107.4 **1 Claim**

1. In combination with a winding device for a safety belt, a tubular spool formed by rolling up a piece of metal into cylindrical form embossed to have serrated edges thereof defining an axial slot connected to one end of the belt, a return spring biasing the spool in take up direction, a housing having a base and end walls upstanding from the base, the walls having bores of predetermined diameter receiving ends of said spool journaled thereby, and a locking device independently operatively interposed between said spool and said housing operable in response to acceleration of said spool in pay out direction to lock the spool to the housing, said locking device comprising a support disc fixed to one end of said spool outside one end wall of said housing, an inertia disc mounted loosely over said spool between said one end wall and said support disc for rotation in a plane perpendicular to the longitudinal axis of the spool and for sliding movement along the spool, axial cams on said support disc comprising surfaces inclined toward the inertia disc in a direction opposite to the pay out direction of rotation of said spool, said inertia disc being a stamping formed in star configuration and having radial arms adjacent said inclined surfaces which ride up said surfaces when the spool is accelerated in pay out direction, said radial arms each having at least one circumferential side being bent out of the plane of rotation of said inertia disc, first abutment noses on said one wall of said housing to abut one side of said arms when the arms ride up said inclined surfaces, and second abutment noses on said support disc at the upper ends of said inclined surfaces facing said first abutment noses and engage-



able with the other sides of said arms when the arms ride up said inclined surfaces, said first and second abutment noses being axially offset so as normally freely to pass by one another during rotation of said spool, a bolt extending axially through said spool and arresting the spool axially, said return spring being connected between one end of said bolt and said housing, one end of said bolt fitting closely into said spool relative to one wall of the housing, one end of said belt having a loop thereon which fits over said bolt, said spool being axially slotted to receive said belt, the shank end of said bolt extending to the vicinity of said support disc, said spool being hollow, said support disc having an extension fitting inside said spool, said extension extending into said spool to a location adjacent to the end wall of said housing, a spacer sleeve on said spool between said support disc and said one end wall of said housing, said inertia disc being mounted on said sleeve, and a conical spring between said one end wall and said inertia disc biasing said inertia disc toward said support disc, the axial extent of said inclined surfaces being equal to the axial extent of said radial arms of said inertia disc at the regions which cooperate with said abutment noses plus the axial spacing between said first and second abutment noses.

3,851,836

VEHICLE OCCUPANT RESTRAINT BELT RETRACTOR

Raymond G. Sprecher, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1973, Ser. No. 390,783

Int. Cl. B65h *75/48*

U.S. Cl. 242—107.7 **3 Claims**

1. In a vehicle occupant restraint belt retractor including a housing adapted to be mounted on a vehicle, a belt reel rotatably supported on the housing for movement in belt winding and unwinding directions so as to wind and unwind an associated restraint belt, spring means normally biasing the belt reel in the belt winding direction of rotation, and an inertia locking

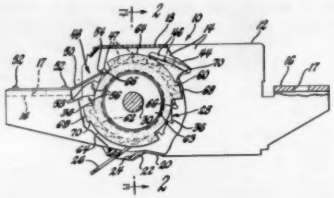
mechanism for selectively locking the belt reel against movement in the belt unwinding direction of rotation, a mechanism for selectively preventing the spring means from rotating the belt reel in the belt winding direction so as to hold the belt in an unwound condition for use, the mechanism comprising:

a plurality of circumferentially spaced surfaces on the belt reel facing in the belt winding direction of rotation;

a detent member mounted on the housing and movable between locked and unlocked positions with respect to the surfaces on the belt reel to prevent the spring means from rotating the belt reel in the belt winding direction while in locked position and to allow such rotation while in unlocked position;

means for biasing the detent member to locked position; and

a control disk frictionally driven with the belt reel and rotatable with respect thereto about the axis of reel rotation, the control disk including an engagement surface extending circumferentially about the axis of reel rotation for an angle less than 360° so as to engage the detent member and block engagement thereof with a number of the adjacent surfaces on the belt reel, the disk defining a notch receiving the detent member to allow engagement of the detent member and any one of the other surfaces



on the reel so as to prevent the belt winding reel rotation, the detent member being alternately engaged with the engagement surface of the disk or received within the notch as the disk rotates with the reel during belt unwinding reel rotation, the end of the engagement surface located in the belt unwinding direction of rotation having a catch surface that engages the detent member and holds the disk against rotation with the reel while holding the detent member out of engagement with the reel as the spring means rotates the reel in the belt winding direction after proceeding from a condition where the detent member is engaged with the engagement surface, and this engagement between the detent member and the catch surface rotating the disk to a limited extent with respect to the reel when the reel is rotated to a limited extent in the belt winding direction such that this relative rotation changes the rotational position of the disk with respect to the reel so as to change surfaces on the reel which the detent member is engageable with or is blocked from engagement with in a manner that allows selective control of the rotational positions at which the detent member holds the belt reel against the winding bias of the spring means so as to thereby allow adjustment of the length of the belt that is held unwound for use.

3,851,837

VEHICLE OCCUPANT RESTRAINT BELT RETRACTOR

Henry W. Griffin, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 4, 1973, Ser. No. 394,060

Int. Cl. A62b *35/00*

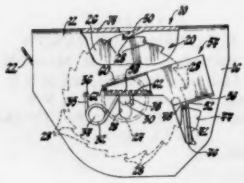
U.S. Cl. 242—107.4 **4 Claims**

1. A vehicle occupant restraint belt retractor comprising:

a housing adapted to be mounted on a vehicle;

a belt reel rotatably supported by the housing and movable in belt winding and unwinding directions of rotation, the belt reel including a drum for receiving an associated restraint belt and a pair of end plates at the ends of the drum, and the end plates defining circumferentially spaced locking surfaces facing in the belt unwinding direction of rotation;

a locking member mounted on the housing for movement between an unlocked position out of engagement with the belt reel and a locked position in engagement with a selected pair of locking surfaces on the end plates so as to prevent belt unwinding rotation of the reel; and



a receptacle carried by the locking member and having mercury received therein, the receptacle including a lower rearward portion normally receiving the mercury so as to position the locking member in the unlocked position and an upper forward portion to which the mercury moves in response to a predetermined deceleration in the rate of forward vehicle movement so as to thereby move the locking member to locked position and thus prevent belt unwinding rotation of the reel in a manner that restrains a belted vehicle occupant during such deceleration.

3,851,838

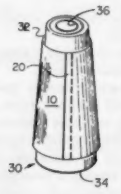
SLIP SLEEVES

William A. Biggs, Jr., 325 Woodland Dr., and Joseph L. Jacobs, 709 Prestwood Dr., both of Hartsville, S.C. 29550

Filed June 22, 1970, Ser. No. 48,251

Int. Cl. B65h *75/10, 75/26*

U.S. Cl. 242—118.32 **1 Claim**



1. A sleeve for utilization on the surface of a yarn carrier comprising: a single ply of flexible material having predetermined surface characteristics; said sleeve being conical with a slight overlap of edges of a blank; and said overlapped edges secured by an adhesive having electrical conductive characteristics, whereby said sleeve may be interfit with a yarn carrier for overcoming and eliminating surface irregularities while establishing the desired carrier surface for proper delivery of yarn wound thereabout.

3,851,839

COMPLIANCE ROLL

Frank R. Hynes, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 21, 1973, Ser. No. 399,590

Int. Cl. B65h *59/00*

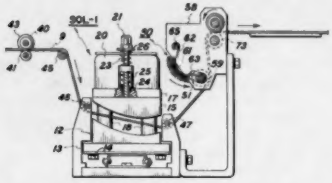
U.S. Cl. 242—147 R **5 Claims**

1. In apparatus for processing a web of film having a developing system including a curvilinear surface adapted to move

into contact with said film whereby the film is tensioned against said curvilinear surface, the improvement comprising means to secure said film on both sides of said developing system to form a film loop of predetermined length therebetween having at least one straight run thereon,

means to place said curvilinear surface into contact with said film along said straight run,

a compliance roll movably positioned between said curvilinear surface and one of said film securing means whereby said compliance roll contacts said film, said compliance roll being arranged to move in compliance with the



change in the film loop geometry caused by the curvilinear surface moving into contact with said film,

bias means operatively associated with said compliance roll for tensioning said roll under a constant load against said film throughout the range of roll movement,

said bias means including a compression spring of substantially constant compression force throughout its displacement.

3,851,840

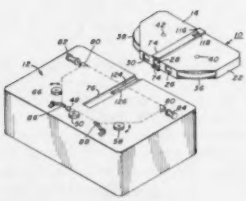
HIGH SPEED CARTRIDGE

Cedric R. Bastiaans, Verona, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 18, 1972, Ser. No. 254,693

Int. Cl. G11b *23/10*

U.S. Cl. 242—198 **2 Claims**



1. A magnetic tape cartridge and playing deck assembly comprising a casing, a pair of spaced reels within the casing, a plurality of tape guides within the casing, a magnetic tape extending from one of said reels around said guides to the other of said reels, opening in the front side wall of said casing for receiving a magnetic head across which the tape will pass, a first roller which engages one side of the tape, a second roller within the casing against which said first roller is pressed with the tape therebetween, a guide slot in said deck, guide strips on opposite sides of said cartridge adapted to be received within said guide slot, a reel brake for said reels, said reel brake comprising a reciprocative body intermediate the reels and having arcuate friction liners on its opposite sides for engagement with the peripheries of said reels, a pin carried on said body and projecting through the top and bottom of said cartridge and said guide strips, and a groove within said guide slot, the groove terminating at a point whereby the pin will engage the end of the groove and disengage the reel brake from said reels when the second roller and tape are pressed against said first roller.

3,851,841

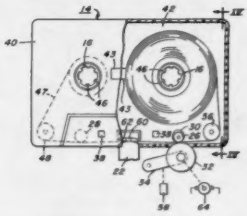
HIGH SPEED TAPE CASSETTE

Cedric R. Bastiaans, Verona, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 18, 1972, Ser. No. 254,691

Int. Cl. G11b *23/10*

U.S. Cl. 242—199 **2 Claims**



1. A magnetic tape cassette comprising a casing of upper and lower mating halves, a pair of spaced reels within the casing, means for driving one of said reels whereby a tape speed of at least about **120** inches per second is achieved, a plurality of tape guides within the casing, and a magnetic tape extending from one of said reels around said guides to the other of said reels, each of said guides comprising a roller of the hourglass type of generally concave cross-sectional configuration, the tape-engaging surface of the roller defining an arc of a circle in cross section with the roller being symmetrical about a plane passing through the roller midway between its ends.

3,851,842

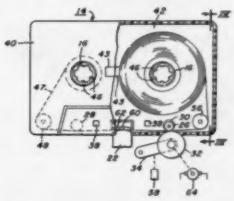
HIGH SPEED TAPE CASSETTE

Cedric R. Bastiaans, 133 Glenhurst Dr., Verona, Pa. 15147

Division of Ser. No. 254,691, May 18, 1972. This application Aug. 8, 1973, Ser. No. 386,686

Int. Cl. G11b *23/10*

U.S. Cl. 242—199 **5 Claims**

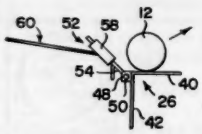


1. in a high speed tape dubbing system, the combination of a tape deck adapted to receive a magnetic tape cassette, said tape cassette comprising a casing of upper and lower mating halves, a pair of spaced reel hubs within the casing, hourglass guide rollers at two corners of the casing, a magnetic tape extending from one of said reel hubs around said guide rollers to the other of said reel hubs, the path of said tape in passing from one of said guide rollers to the other extending along a side wall of the casing, openings in said side wall for receiving at least one transducer across which the tape passes and a driving capstan mounted on said tape deck, openings in said upper and lower halves for receiving an idler roller also mounted on said tape deck such that with the cassette on the tape deck the idler roller will be behind the tape in front of one of said side wall openings, means for urging said driving capstan through said one side wall opening and into engagement with the side of said tape opposite said idler roller, and means for driving said capstan to achieve tape speeds of at least 120 feet per second.

3,851,843
TRANSFER STATION ASSEMBLY

Charles Morris Sandlin, Newnan, Ga., assignor to National Safe Corporation, Clearwater, Fla.

Filed Aug. 24, 1973, Ser. No. 391,222
Int. Cl. B65g *51/32*
U.S. Cl. 243—19 **5 Claims**

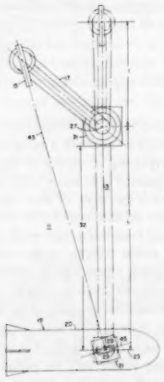


1. A transfer station assembly for a carrier used in combination with a delivery portion and a collector portion of a conveyor system, said assembly comprising: tray means movably mounted in interconnected relation between said delivery portion and said collector portion, biasing means connected to said tray means and disposed relative thereto so as to movably bias said tray means in predetermined relation to said delivery portion and said collector portion, tray activating means including a first wall element and a second wall element rigidly connected to one another and movably disposable in carrier engageable position relative to said delivery portion and said collector portion, said first wall element comprising a first activating surface, said second wall element comprising a second activating surface; said first and second activating surfaces normally disposed in direct communication with and in carrier engageable relation to said delivery portion and said collector portions, respectively, by virtue of the relative disposition of said first and second wall elements and said biasing means.

3,851,844
METHOD OF LAYING A BALLISTIC MISSILE

William W. Stripling; Harold V. White, and Joe S. Hunter, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 328,796, Feb. 1, 1973. This application Oct. 15, 1973, Ser. No. 406,405
Int. Cl. F41g *11/00*
U.S. Cl. 244—3.16 **1 Claim**



1. The method of laying in a target azimuth a compass-oriented ballistic missile having a stable platform with an axis and a mirror in parallel relation therewith, comprising:

aligning said connector and said arm with said telescope in autoreflective alignment with said mirror and said proximal and distal ends in respective engagement with the axis of a north-seeking gyro device and the platform axis for normal relation therewith of said arm,

determining from the north-seeking gyro device the angle θ between the platform axis and the target azimuth;

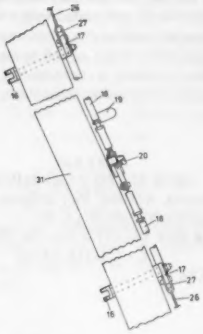
rotating the telescope through an angle β equal to $\sin^{-1}[L/1 \sin \theta]$ where L and 1 are the respective lengths of the arm and the connector; and

rotating the missile platform to autoreflective engagement of the telescope and mirror to lay the missile in the target azimuth.

3,851,845
APERTURE CLOSURE DEVICES

Emrys Ronald Edwards, Chard, England, assignor to Westland Aircraft Limited, Yeovil, Somerset, England

Filed Apr. 9, 1973, Ser. No. 349,197
Claims priority, application Great Britain, Apr. 17, 1972, 17652/72
Int. Cl. B64c *1/00*
U.S. Cl. 244—129 D **15 Claims**



1. An aperture closure device comprising in combination, a closure member, a plurality of supporting means each comprising a hinge pin spaced from an edge of the closure member parallel therewith and supported at its ends between two parallel flange members extending from the closure member, and a hinge in the form of a bolt-like member rotatably mounted in a supporting structure adjacent the aperture and having a cylindrical shaped head portion for location between the flange members on the closure member when the closure member is fitted, the cylindrical shaped head portion having a slot adapted to mate with the hinge pin supported by the flange members, such that rotation of the hinge is effective to retain and to release its associated pin.

3,851,846
SUPPORT AND LEVELING ARRANGEMENT

Olan L. Long, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 4, 1973, Ser. No. 366,839
Int. Cl. F16m *11/24*
U.S. Cl. 248—188.2 **3 Claims**

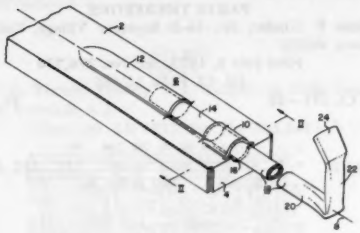
1. A support and leveling arrangement comprising an adjustable leg portion;

a socket for receiving said adjustable leg portion and having a generally oval shaped cross section, said socket formed intergral with and deformed from a web and comprised of one semi-oval band projecting out of said web in one direction and a pair of upstanding semi-oval bands lo-

cated on either side of said one band and projecting out of said web in the other direction;

said adjustable leg portion having a longitudinal member having a substantially oval cross section along at least a part of its length, said adjustable leg portion being relatively freely movable axially in said socket when the oval cross sections of said socket and said adjustable leg portion are in registry, said oval cross sections of said socket and said adjustable leg portion providing an interference lock between said socket portion and said adjustable leg portion in any adjusted position of said adjustable leg portion when said adjustable leg portion is rotated relative to said socket portion;

and means for rotating said adjustable leg portion relative to said socket portion.

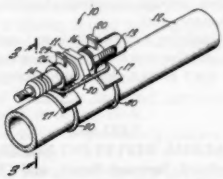


3,851,847

SPARK PLUG HOLDER FOR MOTORCYCLES AND THE LIKE

Robert L. Hinkley, 14160 Red Hill Ave., Tustin, Calif. 92680

Filed Oct. 19, 1973, Ser. No. 408,056
Int. Cl. A47f *13/00*
U.S. Cl. 248—231 **8 Claims**



1. An article of manufacture for removably securing a conventional spark plug to a cylincrical support member such as a frame member of a motorcycle comprising:

first means including a first, hollow, cylindrical, spark plug receiving cap and a first, hollow, semicylindrical, frame member engaging base, the axes of said cap and said base being parallel;

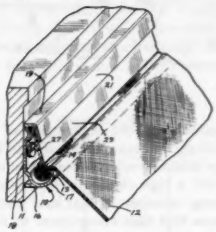
second means including a second, hollow, cylindrical, spark plug receiving cap and a second, hollow, semicylindrical, frame member engaging base, the axes of said second cap and said second base being paralle, said first and second means being adapted to be positioned with the axes of said first cap and said first base coaxial with the axes of said second cap and said second base, respectively; and third means consisting of an elongated, resilient, stretchable member interconnecting said first and second bases, said stretchable member being wrapable around said frame member and connectable to said first and second means to secure said first and second bases to said frame member.

3,851,848

AWNING RAIL

Robert W. Wiele, Jackson, Wyo., assignor to Frank D. Werner, Jackson, Wyo.

Filed Mar. 23, 1973, Ser. No. 344,248
Int. Cl. E04f *10/02*; **A47h** *15/00*; **E06b** *9/08*
U.S. Cl. 248—273 **5 Claims**



1. A fastening device for attaching awnings or similar sheets having an enlarged hem adjacent the edges thereof to a support structure, said device including an elongated member having a base, a first edge portion and a second edge portion spaced from the first edge portion; means to attach said device to a support structure; said first edge portion including a wall extending from the base to form a concave surface facing the second edge portion, said concave surface being of size to receive at least a portion of a hem of a sheet to be held; a flexible lock strip; said second edge portion defining a generally longitudinally extending slot facing said concave surface, said flexible lock strip having a first edge configured to correspond to and being mounted in said slot, said flexible lock strip extending obliquely to the base from said slot toward said wall forming said concave surface, and a second edge of said flexible lock strip being spaced from said wall a distance less than the thickness of a hem of a sheet to be held with the flexible lock strip in a normal rest position, said second edge of said flexible lock strip engaging a hem positioned in the concave surface to lock such a hem in said device, said flexible lock strip being depressable toward said base to permit releasing a hem positioned in the concave surface.

3,851,849

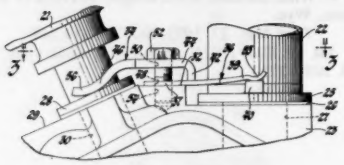
CLAMP ASSEMBLY

Raymond J. Green, Northville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 21, 1973, Ser. No. 361,874
Int. Cl. B25b *5/08*
U.S. Cl. 248—361 B **5 Claims**

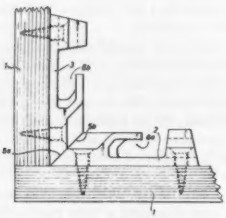
1. A clamp assembly comprising a housing having a pair of component mounting pads and a clamp mounting pad therebetween, first and second components requiring low and high clamping forces respectively against the respective component mounting pads, a pair of clamp members, one of said clamp members being flexible and arranged to rest on said clamp mounting pad while engaging said first component to press said first component against this component's mounting pad, the other of said clamp members being stiff and having a foot extending transverse therefrom arranged to engage said one clamp member, said other clamp member also arranged to engage said second component to press said second component against this component's mounting pad while said foot engages and presses said one clamp member against said

clamp mounting pad and also against said first component, said clamp members having apertures that are aligned and are located intermediate said foot of said other clamp member and where said other clamp member engages said second component, and a single fastener extending through said apertures and secured to said clamp mounting pad for fastening both said clamp members to said clamp mounting pad while also applying force on said other clamp member at a location



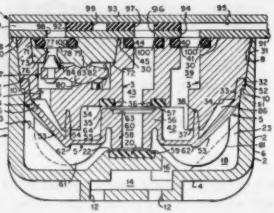
intermediate said foot and the engagement of said other clamp member with said second component so that said other clamp members clamps said second component to this component's mounting pad with a high clamping force while said foot acts on said one clamp member so that said one clamp member flexes and clamps said first component to this component's mounting pad with a low clamping force with the difference in said high and low clamping forces decreasing as the distance between said foot and said fastener is increased.

3,851,850
FORMWORK SYSTEM
Harvey Walker Hixon, 39 Park Dr., London, England
Filed June 13, 1972, Ser. No. 262,323
Int. Cl. B22d 7/10
U.S. Cl. 249—194 **8 Claims**



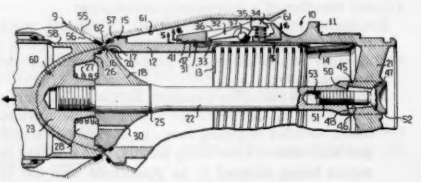
1. A framework system for connecting a pair of framework panels in either coplanar or mutually trasnverse relationship, comprising a connecting unit having a single left-hand first attachment shoe having a first front face, a first rear face and a right-hand beveled edge subtending an acute angle with said first rear face, said first shoe being formed with a first groove; a single right-hand second attachment shoe having a second front face, a second rear face, and a left-hand beveled edge subtending an acute angle with said second rear face, said second shoe being formed with a second groove; a first and a second framework panel, each of said panels having at least one edge and at least one major surface; means on said shoes for securing each of said shoes to a respective one of said framework panels, so that the rear surface of each of said shoes is in contact with said major surface of the associated panel; and a pair of alternately usable shoe clamps, including a first shoe clamp for bridging said first and second grooves only when said rear faces of said shoes and therefore said framework panels are substantially coplanar, and a second shoe clamp for bridging said first and second grooves only when said rear faces of said shoes and therefore said framework panels extend transversely to one another, each of said shoe clamps being formed with engaging portions which are spaced apart from each other and receivable in said first and second grooves, respectively, for urging the beveled edges of said shoes together as the respective clamp moves along said grooves, while the engaging portions of said respective clamp are received in said first and second grooves, respectively.

3,851,851
FLUID LOGIC SYSTEMS, DIAPHRAGM VALVE AND PARTS THEREFORE
William F. Ginder, Jr., 16-D Seymour Village, Unionville, Conn. 06026
Filed July 5, 1973, Ser. No. 376,734
Int. Cl. F16k 31/385
U.S. Cl. 251—25 **37 Claims**



1. A valve comprising:
a. a housing having a cavity therein;
b. a diaphragm forming a chamber in said cavity, said diaphragm having:
  i. a peripheral portion secured in fluid tight relation in said housing,
  ii. a central portion having a passage closure element thereon,
  iii. an intermediate flexible portion and
  iv. a lever extending radially across said intermediate portion having an inner end adjacent to said center portion and an outer end adjacent to said peripheral portion;
c. a fulcrum for said lever between the inner and outer ends thereof;
d. a passageway through said housing communicating with said chamber through an orifice closable by said passage closure element; and
e. means for applying force to the outer end of said lever to rock it on said flucrum to move the central portion transversely to open and/or close said passageway.

3,851,852
AERIAL REFUELING NOZZLE
Roger H. Blanchard, Newport Beach, and Charles R. Clark, Mission, both of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Aug. 16, 1972, Ser. No. 281,002
Int. Cl. F16l 37/28
U.S. Cl. 251—149.1 **12 Claims**



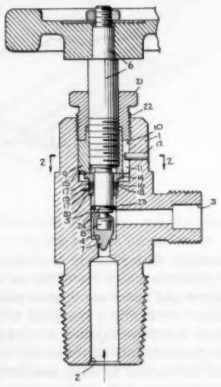
1. In a dispensing head of the type including a nose, a valve seat associated with said nose, and a valve sleeve resiliently

urged towards engagement with said valve seat for sealing against flow and relatively movable to an open position to permit flow around said valve seat and said nose, the improvement comprising mounting means mounting said valve seat for limited axial movement relative to said nose, and means resiliently urging said valve seat away from said nose towards said valve sleeve for maintaining the sealing engagement between said valve sleeve and said valve seat when said sleeve is accidentally bumped.

3,851,853
VALVE

Wilbur O. Teeters, Tenafly, N.J., assignor to Hoke Incorporated, Cresskill, N.J.

Filed Apr. 23, 1973, Ser. No. 353,441
Int. Cl. F16k *41/00*
U.S. Cl. 251—214 **12 Claims**



1. In a fluid control valve having a body with spaced inlet and outlet ports coupled by a conduit including a valve stem seat and having a stem mounting cavity communicating with said conduit an improved valve stem assembly comprising:

a stem with a sealing means for engaging said seat at the inner end of said stem and control threads on a portion of said stem intermediate its inner and outer ends,

a stem guide slidably positioned in said stem mounting cavity and having a threaded aperture engaging the threaded portion of said stem,

means on said guide for preventing relative rotation of said guide in said body,

a stem packing positioned between said guide and said body inwardly of the stem control threads and in sealing engagement with said stem, and

a packing nut threadedly coupled to said body and having an exposed tool engaging portion outwardly of said body and holding said stem guide in said body and urging said stem guide against said packing thereby compressing said packing into sealing engagement with said stem.

3,851,854
CONSTRUCTION ROBOT

Frank V. Roybal, Rt. 3, Box 125 A, Montrose, Colo. 81401

Filed July 5, 1973, Ser. No. 376,921
Int. Cl. B60p *1/10*
U.S. Cl. 254—7 C **3 Claims**

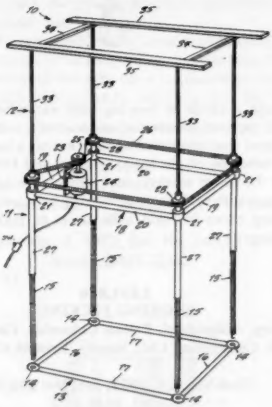
1. An adjustable scaffold which comprises, in combination:

a. A vertically adjustable working deck having externally threaded legs extending downward from the corners of said working deck,

b. Rotatable sleeves, each having,

1. an upper end internally threaded for engaging one of the externally threaded legs of the working deck,
2. an exially hollow center section for receiving the leg of the working deck and for receiving a lower leg,
3. a sprocket rigidly fixed to the rotatable sleeve and having teeth for engaging a drive chain,
4. an externally protruding flange for supporting a thrust bearing which in turn supports a stationary frame socket fitting loosely around said rotatable sleeve,
5. a lower end internally threaded in the opposite hand from the threads of the upper end of the rotatable sleeve, for engaging an externally threaded lower leg which extends downward to a base,

c. a stationary frame having sockets at each corner, each stationary frame socket being provided with a downwardly directed opening which is sized and adapted to fit around the rotatable sleeve and to rest upon the thrust



bearing which in turn rests upon the flange of the rotatable sleeve,

d. lower legs, each having

1. a axially hollow section for slidingly receiving a leg from the working deck thereby giving maximum vertical extensibility to the scaffold,
2. external thread extending from the top of the lower leg to substantially the bottom of the lower leg, for engaging the threads of the lower end of the rotatable sleeve,
3. a non-threaded lower tip of the lower leg for rotatable mounting in a base socket,

e. a base having a base socket at each corner for receiving the rotatable lower tip of each lower leg,

f. a drive chain, entrained around each sprocket of each rotatable sleeve in an endless array, such that drive chain actuation simultaneously turns each rotatable sleeve and hence cause simultaneous axial displacement of the working deck legs and the lower legs,

g. means carried by said stationary frame to actuate said drive chain.

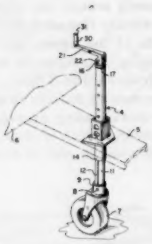
3,851,855
THRUST BALL BEARING CONSTRUCTION FOR TRAILER JACK

Burdette L. Douglass, Rockford, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.

Filed Oct. 30, 1973, Ser. No. 411,003
Int. Cl. B66f *3/10*; F16c *17/04*
U.S. Cl. 254—86 R **3 Claims**

1. In a jack ball-bearing construction, an upright housing having an upper wall provided with a center opening through

which a reduced jack screw shank projects upwardly from the housing for manual rotation, a nut threaded on and movable along said jack screw to convert rotation of the screw into axial movement for raising and lowering a load, thrust bearing improvements comprising upper and lower metal washers engageable with the downwardly facing side of the upper wall of said housing and the upwardly facing end of said screw,

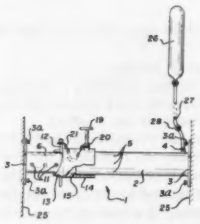


respectively, a circle of bearing balls extending around said shank and captivated between said washers, said upper washer being thinner than the lower washer, having a hardness greater than the hardness of the lower washer, and being more resilient than the lower washer, said washers being brinnelled by load contact with said circle of bearing balls with said brinnelling forming races for said balls so as to make the bearing self-aligning.

3,851,856
SHORING JACKING

Harry Berg, Abbotsford, British Columbia, Canada, assignor to H. B. Contracting Ltd., Surrey, Bristish Columbia, Canada

Filed May 25, 1972, Ser. No. 256,731
Int. Cl. B66f *3/24*
U.S. Cl. 254—93 R **6 Claims**



1. A pneumatic jack for use in the shoring of trenches, comprising

a piston and cylinder unit having a port for

separately operable mechanical means engageable between the piston and cylinder for the secural and retention thereof against retraction from a random expanded condition, wherein said mechanical means comprises

a collar formed with an internal annular step and rotatably engaging the end of said cylinder receiving said piston, said collar having an end extending axially from said cylinder to surround the piston, said end being formed with a pair of inclined circumferential surface profiles, each extending through substantially **180°**,

an abutting element, and

means for selectively locating said abutting element at one of a plurality of positions along said piston for abutting engagement with said surface profiles,

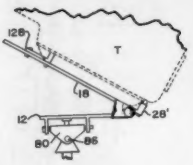
means for preventing rotation of said collar relative to said cylinder,

whereby, subsequent to the pressurization of said cylinder for an extension of the unit to a final extended condition which applies a shoring force to opposed shoring boards lining the walls of a trench, the abutting element can be located on the piston adjacent to the surface profiles and the collar rotated to bring the surface profiles into abutting engagement with the abutting element without further extension of the unit, and then secured.

3,851,857
AUTOMATIC TILTING SAFETY TRANSMISSION ADAPTER BASE

James Burl Notgrass, 1401 E. 52nd St., Odessa, Tex. 79762

Filed June 8, 1973, Ser. No. 368,444
Int. Cl. B66f *3/00*
U.S. Cl. 254—134 **8 Claims**



1. An automatic tilting safety transmission adapter base assembly for removing and installing vehicle transmissions comprising upper and lower contiguous plate members, hinge means pivotally connecting a marginal edge portion of said contiguous plate members together so that the plate members are free to be pivotally moved respective to one another;

stop means connected to said assembly for limiting the angular displacement of one plate member away from the other, said plate members being free to pivot toward and away from one another within the limits of said stop member;

a jack head mount means for removably securing said lower plate member to the head of a jack assembly;

a plurality of elongate swingable brackets, means forming spaced apertures in said brackets; one aperture being for attachment to a transmission;

a plurality of apertures formed in the marginal hinged end portion of said upper plate, bolt means swingably securing one apertured portion of said bracket to said upper plate; and a cut-out in the hinged end of said lower plate member for enabling the plates to be pivoted together with the lower plate member freely clearing said bracket and said bolt means; whereby:

said base assembly can be affixed to a jack head by said jack head mount means, said brackets can be affixed to a transmission, and the transmission can be removed or replaced respective of a vehicle while the plate members freely pivot apart so that the transmission can assume an angular disposition relative to the vehicle and the jack.

3,851,858
TOEBOARD

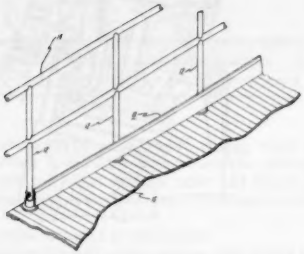
Frank Charles Komiske, Wexford, Pa., assignor to Sybron Corporation, Rochester, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,372
Int. Cl. E04b *17/20*
U.S. Cl. 256—59 **15 Claims**

1. A toeboard for mounting adjacent an edge of an platform, and the like, the toeboard providing a barrier for inhibiting items from sliding off the end of the platform, said toeboard comprising:

a generally planar elongated base member for mounting to the platform along the edge thereof and to extend from said platform in a direction transverse the plane of the platform, said base member having a first dimension for extending in the transverse direction and a second dimension, substantially greater than the first dimension, for extending in the general direction of the edge of the platform, and

attachment means extending from one planar side of the base member for receiving a fastening device for securing the toeboard to the platform, said attachment means extends along the base member in the direction of said



second dimension and is formed with an elongated tubular aperture extending in the direction of said second dimension and with an elongated slot extending parallel to said tubular aperture providing an elongated opening thereto, the dimension of said elongated slot being substantially smaller than the corresponding dimension of said tubular aperture, the arrangement being such that the combination of said tubular aperature and said elongated slot provides a guideway for slidably receiving a fastening device for movement thereof on the direction of the second dimension, for preventing the rotation of the fastening so received, and providing an access for the fastening device.

3,851,859

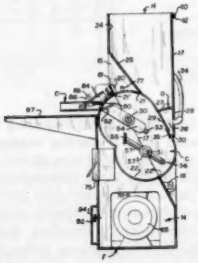
APPARATUS FOR MIXING CLAY

John I. Karp, 1176 20 Rd., Fruita, Colo. 81521

Filed June 4, 1973, Ser. No. 365,999

Int. Cl. B01f *7/02, 7/04*

U.S. Cl. 259—6 **10 Claims**



1. Apparatus for mixing dry and fluid materials such as clay and water to a blend of plastic consistency comprising:

a. a mixing chamber having a cylindrical wall, a rotative paddle means to mix and interblend ingredients within the chamber with one paddle moving close to the cylindrical wall as the paddle means rotates; a receiver opening in the chamber to receive such material and a discharge opening in the cylindrical wall of the chamber adjacent to the path of the said one paddle from whence the blended material may be discharged;

b. a means for charging the mixing chamber through the receiver opening with a selected amount of dry material and fluid to permit the mixing chamber to blend the same;

c. a gate at the discharge opening normally closing this opening to retain material within the chamber when the same is being mixed by the paddle means;

d. a swinging means associated with the gate to swing the gate into the mixing chamber to momentarily traverse the path of the said paddle within the chamber to divert clay carried by the paddle into the discharge opening as the paddle moves to the opening but to shift out of the path of said paddle as the paddle moves past said opening, said swinging means normally permitting the paddle and clay upon it to push the gate to its closed position to prevent such diversion; and

e. a manually-actuated biasing means associated with the swinging means to forcibly swing the gate into the mixing chamber to hold the gate open to discharge clay carried by the paddle as the paddle moves toward the opening.

3,851,860

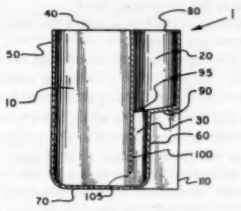
PITCHER

Larry Charles Smith, 22916 Juniper Ave., Torrance, Calif. 90505

Filed Apr. 3, 1972, Ser. No. 240,583

Int. Cl. B01f *11/00*

U.S. Cl. 259—55 **4 Claims**



1. A pitcher for diluting and mixing frozen juice concentrates, comprising:

a main chamber adapted to contain part of the finally mixed juice,

means to support a container of frozen juice concentrate, the support means located adjacent the main chamber and adapted to support the lowermost surface of the container substantially above the bottom of the main chamber, said support means further comprising substantially vertical walls that at least partially enclose the container, a bottom adapted to support the container, and at least one orifice,

a passage from the at least one orifice in the support means which terminates in at least one opening into the main chamber, and

a bottom to the main chamber that slopes downwardly toward the at least one opening near the bottom of the passage,

whereby, when a container of frozen juice concentrate is supported by the support means with the open end down and the concentrate is allowed to thaw, the concentrate will flow into the main chamber, and water poured into the receptacle to dilute the thawed juice concentrate will flow downward through the at least one orifice and out the at least one passage opening near its bottom into the

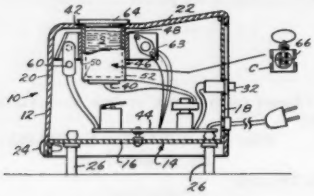
main chamber where it will dilute and mix the concentrate, and because of the downward slope of the bottom of the main chamber, the frozen juice concentrate will tend to collect near said opening where the water first enters said main chamber and thereby increase the amount of mixing as the water is added through the receptacle, and when the pitcher is tilted back and forth in the direction of the receptacle a pumping action will occur between the receptacle and the main chamber to produce additional mixing.

3,851,861

ULTRASONIC CLEANING DEVICE WITH TEMPERATURE RESPONSIVE CUT-OFF

Millard M. Cummins; Robert G. Best, and Thomas Hankins, all of Columbus, Ohio, assignors to Thurman Manufacturing Company, Columbus, Ohio

Filed Sept. 18, 1973, Ser. No. 398,437
Int. Cl. B01f *11/02, 15/06*
U.S. Cl. 259—72 **3 Claims**



1. An ultrasonic cleaning device, comprising:
a receptacle for cleansing fluid;
a piezoelectric crystal secured on the receptacle for imparting vibrations thereto;
heat conducting collar means on said receptacle;
electrically operated heat producing means secured on the collar means for imparting additional heat to the receptacle via the collar means while the crystal vibrates;
a heat sensor communicated to the collar means distally of the heat producing means so that heat conducted by the collar means during operation of the crystal to produce ultrasonic vibrations in the cleansing fluid eventually raises the temperature sensed by the heat sensor to a predetermined cut-off temperature;
power source means for electrically operating the heat producing means and for electrically exciting the piezoelectric crystal, including a manually actuatable, automatically deactuatable switch, communicated to the heat sensor for automatically deactuating the switch when the predetermined cut-off temperature has been reached.

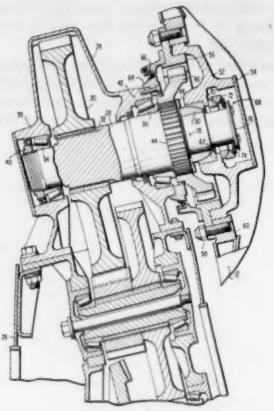
3,851,862

CONCRETE DRUM DRIVE SUPPORT

George Mihulowicz, Greendale, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed July 17, 1972, Ser. No. 272,513
Int. Cl. B28c *5/18*
U.S. Cl. 259—177 R **5 Claims**

1. In a truck-mixer having a concrete mixer drum which is rotatably supported on an inclined axis and is driven and rotatably supported at its lower closed end by a rotary drive and support shaft with means to allow for misalignment, the improvements comprising: a part spherical bearing between the drum and support shaft with the center of the bearing surfaces at the center of load, a gear coupling drive between the closed end of the drum and the drive shaft in a plane passing through the center of load, bearing means rotatably supporting the drive shaft including a main shaft support bearing closely adjacent the center of load so as to minimize



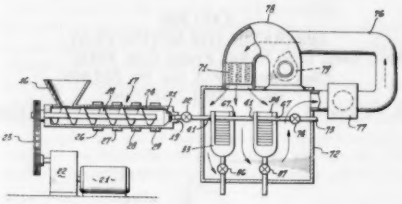
the unsupported length of the drive shaft between the main shaft support bearing and the center of load.

3,851,863

METHOD AND APPARATUS FOR PRE-CONDITIONING SOLID PARTICLE RESIN MATERIAL FOR PLASTIC FORMING

Marvin E. Wallis, 20741 Horace St., Chatsworth, Calif. 91311

Filed Aug. 31, 1972, Ser. No. 285,238
Int. Cl. B29b *3/02*
U.S. Cl. 259—191 **9 Claims**



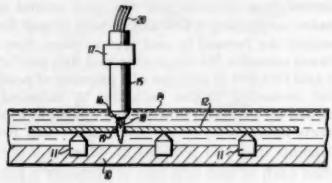
1. In a plastic forming process requiring preparation of a liquified plastic resin from a starting material of solid resin particles and including the initial step of melting said particles by a process which results in an incompletely liquified resin containing some particles that are only partially melted, the improvement in combination therewith comprising the steps of: forcing the incompletely liquified resin and partially melted particles through separations defined by a plurality of closely spaced parallel plate faces formed of a heat conductive material, spreading or flattening the partially melted particles between the plates as the particles are forced through said separations, and simultaneously applying heat to said resin between the plates whereby conditioning of the resin material in this manner results in a substantially homogenous liquid resin.

3,851,864

APPARATUS AND PROCESS FOR SUPPRESSION OF NOISE AND FUMES GENERATED BY PLASMA-ARC CUTTING OPERATION

Samuel L. Miller, Honey Brook, Pa., assignor to Lukens Steel Company, Coatesville, Pa.

Filed June 26, 1973, Ser. No. 373,882
Int. Cl. B23k 7/00
U.S. Cl. 266—23 T 17 Claims



1. The combination of a plasma-arc cutting torch and a water layer which is provided to surround the plasma discharge from said torch and suppress noise and fumes generated by the operation of the torch, the combination comprising:

a nozzle portion included in said torch;

a jacket surrounding said nozzle portion, said jacket having a water inlet;

a water conduit for supplying water to said jacket connected to said inlet; and

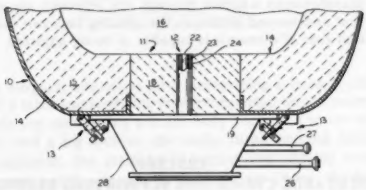
water guidance means extending from said jacket so that the normal operating space relative to a workpiece disposed between said nozzle and the kerf is surrounded, said guidance means having a water flow connection with said jacket's outlet and being adapted to isolate said space with a continuing layer of water therein and thereby suppresses noise and fumes generated in said space.

3,851,865

BOTTOM CLAMP FOR OBM VESSELS

Howard M. Fisher, New Castle, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed July 16, 1973, Ser. No. 379,591
Int. Cl. C21c 5/48
U.S. Cl. 266—35 12 Claims



1. In combination,

a refractory lined metallurgical refining vessel including an opening in the lower portion thereof for receiving a replaceable bottom assembly,

a replaceable bottom assembly for being inserted into said opening, tuyere means extending through said bottom for injecting process gases into molten metal to be contained in said vessel,

at least one clamping means including a first clamp means pivotally mounted on one of said vessel and bottom for movement into and out of a clamping position relative to the other of said bottom and vessel, a second clamp means mounted on the other of said vessel and bottom and engageable with said first clamp means when the latter is in its clamping position, said second clamp means including quick release locking means for securing said first clamp means in its clamped position to secure said bottom assembly to said vessel, and

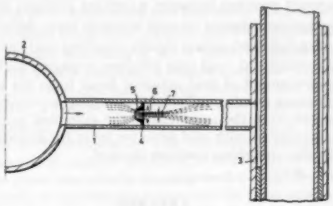
engageable means mounted on the other of said vessel and bottom, said first clamp means being movable into engagement with said engageable means, said engageable means includes a surface having an end located a first radial distance from the pivot axis of said first clamp means and a second portion located a greater radial distance therefrom, said first clamp means including engagement means movable over said end and onto said surface as said first clamp means moves into its clamped position.

3,851,866

PROCESS AND A DEVICE FOR EVEN DISTRIBUTION AND ALTERNATING SUPPLY OF LIQUID AND GASEOUS PROTECTIVE MEDIA FOR THE REFINING GAS TUYERES OF A CONVERTER

Helmut Knuppel 8458, Richard-Wagner-Strabe 1; Karl Brotzmann, Fentschweg 6, and Hans Georg Fassbinder, Schelmesgraben 20a, all of Sulzbach Rosenberg, Germany

Division of Ser. No. 313,308, Dec. 8, 1972. This application Feb. 19, 1974, Ser. No. 443,577
Claims priority, application Germany, Dec. 9, 1971, 2161000
Int. Cl. C21c 5/48
U.S. Cl. 266—41 7 Claims



1. An improved device for evenly distributing and alternately supplying liquid and gaseous protecting media to refining gas tuyeres in a convertor wherein each tuyere consists of two concentric tubes, oxygen being supplied into the convertor through the central one of the tubes and a liquid or gaseous protecting medium being supplied to said convertor through the annular space between the two tubes; which device comprises: separate individual supply lines for the liquid and gaseous protecting media connected to a selecting device near the convertor mantle and means connecting said selecting device to each individual tuyere.

3,851,867

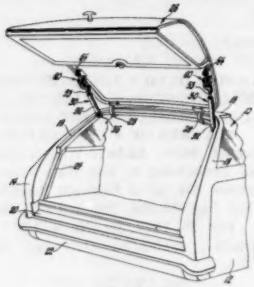
PNEUMATIC ACTUATOR CONTROL APPARATUS

John J. Fricko, Harper Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 9, 1973, Ser. No. 377,226
Int. Cl. F16f 5/00
U.S. Cl. 267—120 2 Claims

1. In a pneumatic actuator assembly for effecting relative movement between a pair of structural elements, said actuator assembly being of the type including a cylinder tube portion disposed on one of said structural elements, a piston slidably disposed in said cylinder tube portion and dividing the latter into a pair of chambers, a piston rod slidably disposed on said cylinder tube portion and operatively connected to said piston, means on said piston defining a passage between said pair of chambers, a valve disposed on said piston for movement between an open position and a closed position blocking said passage, a control rod operatively connected to said valve and

disposed on said piston rod for reciprocation between an extended position and a retracted position corresponding respectively to the open and the closed position of said valve, and a pressurized gaseous medium in said chambers for effecting movement of said piston rod in the open position of said valve, the improvement comprising, a support member disposed between said piston rod and the other of said pair of structural elements so that movement of said piston rod relative to said cylinder tube portion effects relative movement between said pair of structural elements, an actuator lever



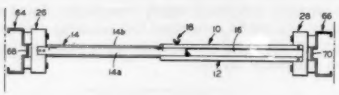
disposed on said support member for rotation about an axis of said support member between a locking position and an unlocking position, means on said actuator lever defining a cam slot, a cam follower, means rigidly attaching said cam follower to said control rod, said cam follower engaging said cam slot so that movement of said actuator lever from the locking to the unlocking position effects concurrent movement of said control rod from the retracted to the extended position, and means associated with said actuator lever for maintaining the latter in the unlocking position thereof.

3,851,868

ADJUSTABLE DOOR BUCK SPREADER

Guy Lagasse, 94 Bush Hill Rd., Manchester, Conn. 06040

Filed May 30, 1973, Ser. No. 365,167
Int. Cl. E04f *21/04*; B23q *3/15*
U.S. Cl. 269—8 **8 Claims**



1. An adjustable door buck spreader for use in installing door frames comprising:

a. a pair of elongated members supported in overlapping relation relative to each other;

b. buck engaging means mounted at the free ends of said pair of elongated members, said buck engaging means comprising a first plate mounted at the free end of one of said pair of elongated members, a second plate mounted at the free end of the other of said pair of elongated members, a first pair of elements supported in spaced relation on said first plate so as to provide when said first plate and said first pair of elements are in the assembled condition a substantially U-shaped configuration, and a second pair of elements supported in spaced relation on said second plate so as to provide when said second plate and said second pair of elements are in the assembled condition a substantially U-shaped configuration;

c. measuring means provided on said pair of elongated members operable for indicating the distance by which said buck engaging means are spaced apart;

d. first adjustment means operable for adjusting the relative positions of said pair of elongated members by moving said pair of elongated members relative to each other thereby to vary the distance by which said buck engaging means are spaced apart; and

e. second adjustment means operable for adjusting said buck engaging means to enable the spreader to be employed for installing door frames wherein the door bucks thereof have different size ribs, said second adjustment means comprising a first slot formed in said first plate, a second slot formed in said second plate, first mounting means operable for supporting said first pair of elements in said first slot in any one of a plurality of positions, said first mounting means including a threaded opening formed off center in at least one of said first pair of elements operable to divide said one of said first pair of elements into two portions of differing widths so that when each of said first pair of elements is supported in said first slot in one of said plurality of positions thereof with one of said two portions of said one of said first pair of elements disposed towards the other element of said first pair of elements a first distance is defined therebetween and when each of said pair of elements is supported in said first slot in a second of said plurality of positions thereof with the other of said two portions of said one of said first pair of elements disposed towards the other element of said first pair of elements a second distance is defined therebetween wherein through the relative use of said first and second distances the spacing between said first pair of elements is capable of being adjusted, and second mounting means operable for supporting said second pair of elements in said second slot in any one of a plurality of positions, said second mounting means including a threaded opening formed off center in at least one of said second pair of elements operable to divide said one of said second pair of elements into two portions of differing widths so that when each of said second pair of elements is supported in said second slot in one of said plurality of positions thereof with one of said two portions of said one of said second pair of elements disposed towards the other element of said second pair of elements a first distance is defined therebetween and when each of said second pair of elements is supported in said second slot in a second of said plurality of positions thereof with the other of said two portions of said one of said second pair of elements disposed towards the other element of said second pair of elements a second distance is defined therebetween wherein through the selective use of said first and second distances the spacing between said second pair of elements is capable of being adjusted.

3,851,869

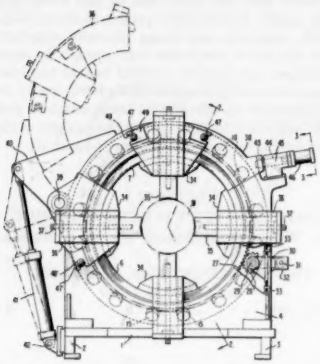
ROTATABLE CHUCK FOR SUPPORTING ELONGATE WORK PIECE

Marvin L. Damewood, Knoxville, Tenn., assignor to W. J. Savage Co., Inc., Knoxville, Tenn.

Filed July 18, 1973, Ser. No. 380,372
Int. Cl. B23g *1/16*
U.S. Cl. 269—61 **9 Claims**

1. A chuck for an elongated work piece, comprising a support, a ring mounted on the support, means on the ring including jaws mounted for engagement with the work piece, said ring including a body portion and segment detachably mounted thereon for opening movement with respect to the body portion of the ring for insertion and removal of a work piece in the ring, and means carried by said support for circumferentially engaging and supporting the body portion and

the segment of the ring for rotation relative thereto, at least a portion of said engaging and supporting means being adjust-



able radially of the ring, and means independent of the engaging and supporting means for driving said ring in rotation.

3,851,870

SURGICAL OPERATION TABLE

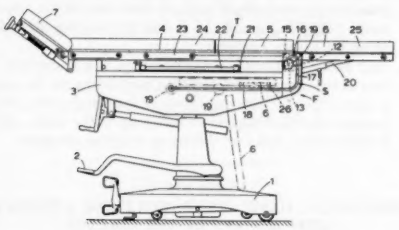
Ronald Joseph Cook, London, England, assignor to Matburn (Holdings) Limited, London, England

Filed May 11, 1973, Ser. No. 359,339

Claims priority, application Great Britain, May 22, 1972, 23935/72

Int. Cl. A61g *13/00*

U.S. Cl. 269—322 **1 Claim**



1. A surgical operation table comprising a base, a pedestal, and a table top receiving frame supported on the pedestal, the table top comprising a main body section, a lower trunk section, and a leg section, the body, turnk and leg sections being coplanar, the main body section and the leg section being permanently engaged to the table top frame, the lower trunk section being readily removable from between the main body section and the leg section of the table top, the main body section being reciprocably movable towards and into the space vacated by the lower trunk section on removal thereof, the leg section being swingable about its permanent engagement to the table top frame from a position normally coplanar with the main body section to a position at right angles thereto or selectively to storage position below the main body section and wherein the table top supporting frame includes a pair of downwardly extending brackets on opposite sides thereof, slots in the brackets extending downwardly and rearwardly of the table top, and the leg section is provided with laterally extending pins at the end thereof proximate the body section, the pins being engaged to the slots and slidable therealong.

3,851,871

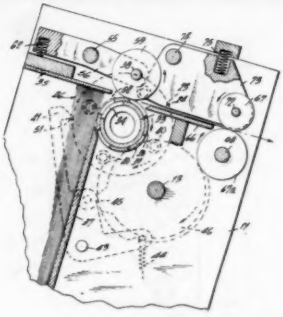
HIGH SPEED SHEET FEEDING APPARATUS

Theodore F. Aronson, 2108 Sunrise Key Blvd., Fort Lauderdale, Fla. 33304

Filed Dec. 10, 1973, Ser. No. 423,144

Int. Cl. B65h *3/10, 5/06*

U.S. Cl. 271—11 **9 Claims**



1. A high speed sheet feeding apparatus for leading individual sheets out of a stack of sheets along a desired path comprising a base plate, spaced upstanding side plates secured to the base plate, opposed first and second shafts carried by the side plates at their outer ends and extending inwardly of the side plates toward each other, a clutch member coupled to the first shaft, means including a drive shaft to impart rotary motion to the clutch member, a hollow perforate cylindrical sheet feed member coaxially carried between the first and second shafts, a hollow cylindrical vacuum chamber within the feed member, said vacuum chamber having at least one slot therein in communication with the interior thereof and a constant source of vacuum attached to said vacuum chamber, a rotatable plate operatively coupled to the sheet feed member, a plurality of spaced pins carried by the plate and extending outwardly thereof, a pawl swingably disposed in the path of the pins to normally restrain the pins, a cam adjacent said pawl to swing the pawl into and out of engagement with the pins, a hopper to receive the stack of sheets having a bottom support and upstanding walls, said bottom support being provided with an opening therein through which the lowermost sheet can be extracted, said bottom support being nonvertically disposed and with the lowermost sheet in contact with the sheet feed member through the bottom member opening, rollers to guide the sheet as it is being fed by the sheet feed member, and a depending detent partially encircling the pin upon which it is brought to rest whereby when the pawl is initially released from the pin, the detent will impart a short counter revolution to the sheet feed member.

3,851,872

SORTING APPARATUS FOR COLLATING SIMPLEX AND DUPLEX COPIES

Dennis P. Gerbasi, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 15, 1973, Ser. No. 341,448

Int. Cl. B65h *29/60*

U.S. Cl. 271—173 **1 Claim**

1. In a copier/duplicator machine which produces simplex and duplex copy sheets to be sorted an improved sorting apparatus for sorting in simplex and duplex modes of operation comprising:

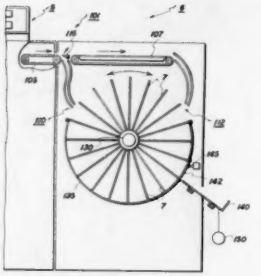
a frame;

a rotatable member supported in said frame;

an array of tray members arranged axially of said rotatable member;

drive means for rotating said rotatable member in one direction when sorting simplex copies and the opposite direction when sorting duplex copies;

conveyor means including a deflector member for directing copy sheets towards one feed zone adjacent the path of said tray members on one side and another feed zone adjacent the path of said tray members on another side; control means for supplying signals to said drive means and said deflector member to rotate said tray member in



a predetermined direction and direct sheets to a selected feed zone depending on whether simplex or duplex sorting mode of operation is desired;

gate means positioned adjacent to the path of said tray members adapted to unload a collated set of sheets from each tray member into a receiving tray;

wherein said receiving tray is slideable across the sheet discharge path and means to slide the receiving tray in reciprocating fashion upon receiving each copy set.

3,851,873

ASYMMETRIC BARS FOR USE IN GYMANASTICS

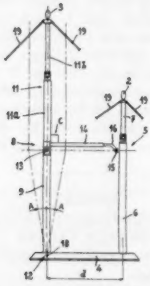
Bernard Jean Thomasson, Sainte Foy Les Lyon, France, assignor to Thomasson, Lyon, Rhone, France

Filed Sept. 10, 1973, Ser. No. 396,104

Claims priority, application France, Sept. 25, 1972, 72.34464

Int. Cl. A63b *3/00*

U.S. Cl. 272—63 **5 Claims**



1. Adjustable asymmetric bars for use in gymnastics comprising a stand;

a lower handrail supported by at least one upright, each of said at least one lower handrail supporting upright being fixedly mounted to said stand in a vertical position and means for adjusting the level of said lower handrail with respect to said stand;

an upper handrail supported by at least one upright, each of said at least one upper handrail supporting upright being inclinable and comprising two semi-uprights, the lower of said semi-uprights being pivotally attached at its lower end to said stand and having its upper end located at a level lower than the upper end of said lower hand-rail, and the upper of said semi-uprights being arranged substantially vertically and being pivotally attached at its base to the top of said lower semi-upright by means of a pin arranged substantially parallel to said handrails;

a telescopic bar arranged substantially horizontally pivotally connecting said upright of said lower handrail and being fixedly connected to said upper semi-upright of the adjacent inclinable upright of said upper handrail.

3,851,874

PUSH-PULL TYPE EXERCISING DEVICE

Douglas G. Wilkin, 3061 Evelyn St., La Crescenta, Calif. 91214

Filed Mar. 23, 1973, Ser. No. 344,104

Int. Cl. A63b *21/00*

U.S. Cl. 272—81 **9 Claims**

1. In an exercising machine:

a. a pulley assembly, for receiving a cable;

b. a cable extending around the pulley assembly and having attachments at opposite ends, at least one of the attachments being engageable by a user for moving the cable along the pulley assembly;

c. said assembly having a means which is non-circular so that as the means is rotated by a user acting on the cable a cyclic sidewise movement will be imparted to the cable, causing vibration motion to be set up in the cable which is transmitted to a user during an exercise program.

3,851,875

ELECTRICAL GAME APPARATUS USING A HUMAN BODY AS PART OF THE CIRCUIT

Jeffrey D. Breslow, Chicago, and Norman Kramer, Skokie, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 6, 1972, Ser. No. 215,782

Int. Cl. A63f *9/00*

U.S. Cl. 273—1 E **12 Claims**

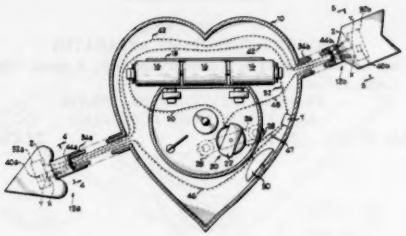
1. A game apparatus comprising:

a housing;

a pair of handles protruding from said housing for grasping by players of the game, said handles having a conductive portion mounted thereon;

an incomplete circuit defining a partial conductive path for electricity, said incomplete circuit including two spaced apart terminals connected to the conductive portions of the handles and a plurality of switches, one for each player, for selectively connecting one portion of the incomplete circuit with another portion of the incomplete circuit in at least two different ways, whereby said incomplete circuit comprises part of a complete electrical circuit whenever the terminals are electrically connected and the switches connect the incomplete circuit together in an electrically complete manner;

signal means mounted within the housing and connected to said incomplete circuit and actuatable in response to said power source whenever the circuit is successfully completed;



an electrical power source connected to said circuit of insufficient power to harm a player of the game who touches the conductive portions of said handles; and

a spinner mounted on said housing having indicia thereon directing which parts of a player's body should be touched by another player.

3,851,876

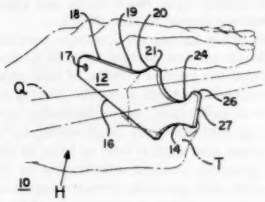
TRAINING AID-GUIDE DEVICE FOR POOL CUE

Merle W. Baker, 1518 Claybourne Dr., Toledo, Ohio 43614

Filed May 21, 1973, Ser. No. 362,520

Int. Cl. A63d *15/10*

U.S. Cl. 273—24 **2 Claims**



1. A hand-held guide device for pool or billiard cues, said device comprising a principal body of sheet material having a generally rectangular elongate configuration and adapted to be held by an average hand,

a. said body having an upper notch in one corner receptive of a pool cue and serving as a guide or support for the cue in its normal axial movement in use as controlled by the user,

b. said body including a cut out thumb notch in a corner next adjacent said one corner and beneath the upper cue notch, accommodating the thumb of the user in a natural holding or gripping of the device, said notch being contoured and located to receive lateral and upward thumb pressure, and

c. said body including an upper edge adapted for contact with the palm of the hand of the user when the user's thumb is contacting said notch and said upper edge in contact with said palm providing oppositional pressure of said palm meeting generally upward and lateral thumb pressure applied on the thumb notch by the user, whereby hand holding of the device is facilitated.

3,851,877

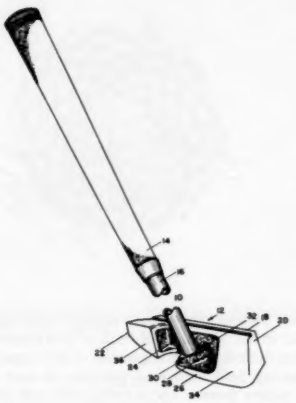
PUTTER HEAD

James D. Giambazi, 12 Abbott St., Cumberland Hill, R.I. 02864

Filed Dec. 22, 1972, Ser. No. 317,639

Int. Cl. A63b *53/04*

U.S. Cl. 273—78 **7 Claims**



1. A golf putter having a grip, shaft and head, said head comprising:

a body section having a front face for striking the ball and a back surface behind said front face and a toe portion and a heel portion; each said portion being interconnected with said body section and at least one of said portions extending rearwardly beyond said back surface; a support member, cantilevered from only one of said portions extending rearwardly beyond said back surface, and extending along said back surface behind said front face and spaced from said back surface to form an elongated slot between said back surface and said support member behind said front face and extending along said back surface in the direction of the extent of said front face between said toe and heel portions; and

means, on said support member and spaced from said portion from which said support member is cantilevered, for interconnecting said support member and said shaft.

3,851,878

BOARD-TYPE GAME WITH REMOVABLE PLAY SELECTOR MEMBER

Joseph Brian Clarke, Nuns Island, Quebec, Canada, assignor to Coleco Industries, Inc., Hartford, Conn.

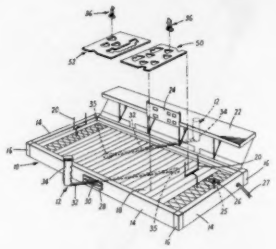
Filed May 16, 1972, Ser. No. 253,890

Int. Cl. A63f *7/06*

U.S. Cl. 273—94 R **17 Claims**

1. In a game apparatus, the combination comprising: a game board member including a substantially planar playing portion having means on the upper surface thereof defining a playing field; an electric vibrating mechanism operatively connected to said playing portion for vibration thereof; a multiplicity of player pieces supported by base portions thereof upon said playing portion of said game board member in opposing team formations; and a pair of substantially planar removable play selector members on said game board upper surface, each of said play selector members having a multiplicity of apertures therethrough spaced inwardly of the side margins thereof and from each other, a multiplicity of said player pieces having their base portions disposed within a multiplicity of said apertures of each said play selector member in a predetermined formation on said playing field defined by said apertures of

said play selector members to provide a line of players along the side of the selector members facing the players of the opposing team and a plurality of player members having their base portions disposed in some of said apertures of each said play selector members in spaced relationship behind said line of players thereof, said apertures being larger than the base portions of said player pieces to permit removal of said selector member from the predetermined formation of said player



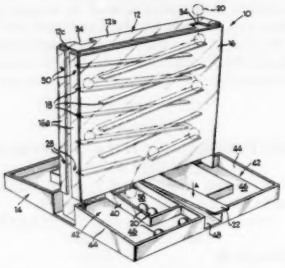
members without disturbance thereof, said player members disposed in the apertures of each of said play selector members thus defining an arrangement of two opposing teams on said playing field, said base portions of said player pieces having means thereon cooperating with said playing portion for movement upon said playing portion during vibration thereof whereby vibration of said playing portion causes movement of at least some of said player pieces supported thereon.

3,851,879

GAME DEVICE WITH SELECTIVELY MOVABLE PANEL STRUCTURE

Alan A. Hicks, Wilmette, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 5, 1973, Ser. No. 412,645
Int. Cl. A63f *7/02*
U.S. Cl. 273—120 R **15 Claims**



1. A game device, comprising:
a base structure;
a pair of generally upright panels mounted on said base structure for relative movement of at least one of said panels toward and away from the other panel;
means defining a tortuous path between said panels from an upper area to a lower area thereof;
a playing object for movement by gravity downwardly along said tortuous path, said playing object having a width greater than the width of at least portions of said tortuous path; and
means for selectively and relatively moving said panels between a clamping position whereby said playing object is pinched and held between the panels and a release position wherein the playing object is permitted to freely move down said tortuous path under gravity whereby a player of the game attempts to control the downward motion of the playing object along the tortuous path by selectively and relatively moving said panels.

3,851,880

HOCKEY-TYPE GAME APPARATUS

Glen L. Ritch, 3129 S. Tumblerweed Rd., Laguna Niguel, Calif. 93514

Filed Oct. 6, 1972, Ser. No. 295,670
Int. Cl. A63b *59/00, 41/00, 71/02*
U.S. Cl. 273—128 R **22 Claims**

1. Hockey-type game apparatus, which comprises:
a. a lightweight elongate object shaped to be propelled along a playing surface in a direction longitudinal to said object, and also shaped to roll along said playing surface in a direction lateral to said object, said object having a length greatly in excess of the diameter thereof, and
b. a hockey stick having an elongate shaft adapted to be held by a player,
said stick also having at one end of said shaft an elongate blade shaped to strike said object to either propel it along said playing surface in a direction longitudinal to said object, or to roll it along said playing surface in a direction lateral to said object,
said blade having an upwardly concave region at the lower portion thereof so as to fit downward over at least the central portion of said object and thereby move said object along the playing surface in unison with said blade, the relationship between said shaft and said upwardly concave region being such that, when said shaft is held in front of the player, and in upwardly inclined relationship to the playing field, with said upwardly concave region seated over said elongate object, a portion of said blade is behind said object whereby the player may push said object forwardly in a controlled manner.

3,851,881

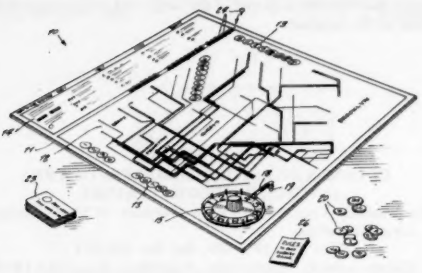
SUBWAY BOARD GAME APPARATUS

Theodore F. Smith, 82010 Colgate Ave., Apt. 10G, Bronx, N.Y. 10473

Filed Apr. 25, 1973, Ser. No. 354,168
Int. Cl. A63f *3/04*
U.S. Cl. 273—134 AC **3 Claims**

1. In a subway game, the combination of a game board having thereon a playing field which comprises an actual map of a subway system of a municipality and including a plurality of separate subway lines at least some of which have starting and ending stations different from every other line, said subway lines having thereon a number of stations including visually distinguishable express stations and local stations, a plurality of tacks which can be inserted into the game board, each tack having imprinted thereon the specific designation of one of the trains of the actual subway system which travels along a specific restricted route corresponding to one of the subway lines, a plurality of playing pieces for movement upon said game board, the number of playing pieces corresponding to

the number of said tacks, each of the playing pieces having imprinted thereon a designation identical with that of a corresponding one of the tacks, a plurality of tokens for division among the participants for use by the participants of said



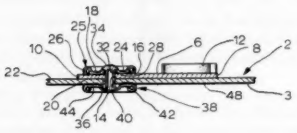
game, a spinner for selecting by chance a number from a group of numbers, and playing cards to determine favorable or unfavorable progress of a participant as well as the gaining or losing of tokens.

3,851,882

BINGO CARD WITH PIVOTED MASKING TABS

Paul P. Steinle, and Paul R. Steinle, both of 6314 W. Estes Ave., Chicago, Ill. 60646

Filed Oct. 15, 1973, Ser. No. 406,300
Int. Cl. A63f 3/06
U.S. Cl. 273—136 F **4 Claims**



1. A bingo card marrking device comprising;

a base element having top and bottom sides and having on the top side a series of numerals arranged in horizontal and vertical rows;

a masking element tab adjacent to each numeral;

a snap fastener pivotally securing each tab to the base element and comprising a shank extending through said elements and having a head at one end opposing said base element at the bottom thereof;

means providing a high coefficient of friction between the head and the bottom side of said base element resisting turning of the fastener during normal pivotal movements of the tab element to covering and uncovering positions with reference to the adjacent numeral;

a snap removably fastened to said shank and embracing the respective tab element with the top side of the base element;

means providing a high coefficient of friction between the tab element and the snap to resist pivotal movement of the tab element with respect to said snap and

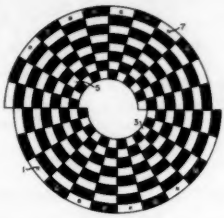
said tab element and said top said of the base element having smooth engaging interfaces for accommodating pivotal movement therebetween with minimal wear.

3,851,883

CHESS GAME BOARD

David B. Hitchcock, and James L. Laurie, both of 129½ W. John St., Maumee, Ohio

Filed Jan. 8, 1973, Ser. No. 321,649
Int. Cl. A63f 3/02
U.S. Cl. 273—131 B **6 Claims**



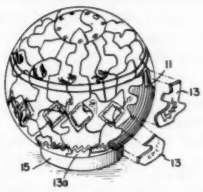
1. A chess game board having the outer configuration and playing pattern shown in FIG. 1 of the drawings.

3,851,884

THREE DIMENSIONAL SHEET PUZZLE

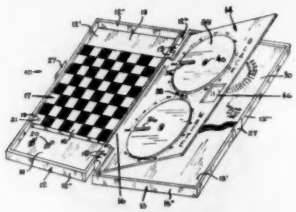
Rolf Myller, 1165 Fifth Ave., New York, N.Y. 10029

Filed May 30, 1973, Ser. No. 365,207
Int. Cl. A63f 9/12
U.S. Cl. 273—157 R **5 Claims**



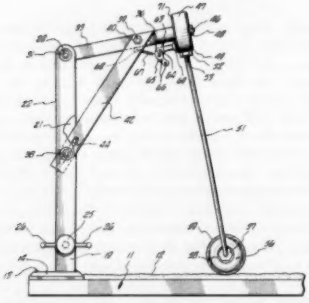
1. A three dimensional sheet puzzle comprising a three dimensional base having a surface curved along two surface dimensions, a plurality of flexible puzzle pieces in sheet form formed from flat sheet material which will lay flat without strain, said puzzle pieces and said base including mounting means to hold said puzzle pieces in position when applied to said curved surface, said mounting means comprising means to provide magnetic attraction between said pieces and said curved surface, the peripheries of said pieces distorting to shapes when applied to said base different from that when laying unstrained and flat because of the curvature of said base along two surface dimensions, said pieces being shaped when formed from said flat sheet material so that said different shapes to which the peripheries of said pieces distort when applied to said base have edges which fit together to cover said curved surface, said puzzle pieces being sufficiently flexible so that said mounting means will hold said pieces in engagement with said curved surface throughout the entire surface of each of said pieces in conformity with the contour of said curved surface.

3,851,885
CHESS GAME DEVICE
Michael Paul Pepkowski, and Guy Jean Houle, both of 316 Windermere Rd., Beaconsfield, Quebec, Canada
Filed Mar. 8, 1973, Ser. No. 339,110
Int. Cl. A63f 3/02; G09b 1/00
U.S. Cl. 273—136 B 8 Claims



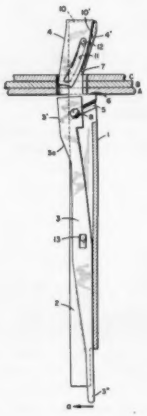
1. A chess game device comprising a plurality of chessmen elements, a checkered chess board on which said chessmen elements may be positioned, at least one data sheet having two complete groups of coded instructions printed thereon to indicate each move in a plurality of moves for particular ones of said chessmen elements of two complete sets of elements in a predetermined chess game, said coded instructions of each group being printed adjacent one another along an arcuate plane on an arc of a circle, a sequential data sheet reading member associated with said at least one data sheet, said reading member being a flat card-like member having a disc secured thereto, said disc having two diametrically opposed data reading slots adjacent the peripheral edge thereof, at least one arcuate aperture in said card-like member and located under said disc adjacent the periphery thereof, said disc being rotatable about its center to said card-like member to permit said data reading slots to travel through a plurality of positions along said at least one arcuate aperture for sequential visual access of said individual ones of said plurality of coded instructions of a respective group of said two groups of coded instructions on said associated data sheet.

3,851,886
FOLDABLE GOLF PRACTICE SWING APPARATUS
Armando E. Acosta, Los Angeles, Calif., assignor to Abner J. Martinson, Redondo, Calif.
Filed Apr. 15, 1974, Ser. No. 460,872
Int. Cl. A63b 69/36
U.S. Cl. 273—197 A 8 Claims



1. A golf swing practice device comprising a substantially planar base, a pair of spaced columns extending from the base, first pivot means securing the columns to the base, second pivot means at the end of the columns remote from the base, a support arm secured by the second pivot means and adapted to extend from the spaced columns at an angle thereto, means for locking the support arm at a selected angle to the spaced columns, a bearing on the support arm, a target rod fixed to the bearing so as to extend away from the support arm, a target ball retainer at an end of the target rod, and a target ball fixed to the retainer.

3,851,887
COLUMNS OF RECORD THROWERS OF THE AUTOMATIC RECORD PLAYERS
Raul Antonio Vega, Vieytes 1386 Martinez, PCIA de Buenos Aires, Argentina
Filed Nov. 20, 1973, Ser. No. 417,573
Claims priority, application Argentina, Jan. 28, 1973, 246338
Int. Cl. G11b 17/04
U.S. Cl. 274—10 S 3 Claims

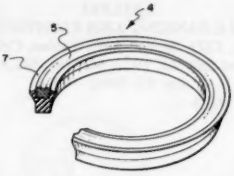


1. Automatic record player changer mechanism comprising a cylindrical column having a longitudinal groove within said column and running the entire length thereof, a first lever of less length than the groove positioned within the groove and having a fulcrum near the midpoint of the lever, said first lever having a perforation therein near its upper end into which a ball is positioned, a record supporting tooth in the column near the top end of the lever where the record is positioned until freed by the lever, said tooth creating a perforation in the column, said groove near the top of said first lever having on both sides thereof generally transverse grooves extending upwardly toward the tooth and into which transverse grooves the ball is placed so that upon pivoting of the lever transverse to the axis of the column about the fulcrum the lever moves in an ascending or descending direction and releases the bottom most record from the tooth, and a small axially movable lever above the tooth composed of two identically rolled pieces each having a curved slot therein and positioned within the longitudinal groove by means of a pin passing through said slots and column, said small lever being positioned to hold the second record as the bottom most record is released.

3,851,888
MACHINERY SEAL

Alma A. Limpson, Jr., 4122 Kestrel, Salt Lake City, Utah 84120, and Gordon T. Zitting, 2136 E. 8200 South, Sandy, Utah 84070

Filed Mar. 21, 1973, Ser. No. 343,324
Int. Cl. F16j 15/32
U.S. Cl. 277—206 2 Claims



1. A composite seal assembly for machinery comprising: an annular elastomeric boot having an exposed annular groove and an elastomeric resilient ring spring received into the annular groove;

the boot being of one-piece construction and comprising (a) a rectangular base portion defined by substantially planar inside and outside surfaces joined one to the other by a substantially planar base surface and (b) a contiguous bifurcated portion defining said annular groove located opposite said planar base surface, said bifurcated portion having a transverse cross-section characterized by a pair of oppositely extending substantially triangular portions each comprisisng an angular tip and being disposed exterior of the annular groove and respectively bridging between one of said planar side surfaces and the annular groove, the tip-to-tip distance being essentially parallel to but substantially greater than the side surface-to-side surface distance, the surface defining the annular groove comprising opposed inwardly directed lobes extending into and defining the minimum transverse dimension across said groove, the tips and apex of the lobes being generally aligned each with the others, the transverse dimension immediately adjacent said lobes in the annular groove being substantially greater than said minimum transverse dimension;

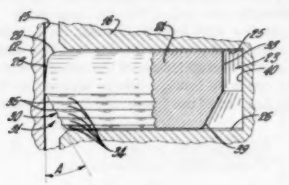
the spring comprising opposed recesses shaped to correspond to and mate with the lobes, the distance between said recesses being greater than said minimum transverse dimension causing a spreading of the tips when the spring is placed within the annular recess in said mating relationship, the spring further comprising an exposed enlarged portion projecting outward from the annular groove beyond any part of the boot a substantial distance whereby force upon the exposed enlarged portion toward the annular groove will distort the spring filling, at least in part, the recesses and further displacing the tips away from each other by application of said filling force to the boot lobes, for improved sealing.

3,851,889
RECIPROCATING SYSTEM AND HYDRODYNAMIC PISTON RING THEREFOR

Kenneth J. Nisper, Spring Lake, Mich., assignor to Questor Corporation, Toledo, Ohio

Filed Feb. 15, 1973, Ser. No. 332,601
Int. Cl. F16j 9/00
U.S. Cl. 277—214 7 Claims

1. A piston ring construction adapted to be mounted in an annular groove in a piston of a reciprocating system comprising a parted annular body, said body having an exterior peripheral sealing surface adjacent the mid region of the body, and said body having an exterior substantially frusto-conically shaped area below the mid region extending downwardly and inwardly from the peripheral sealing surface defining a zone for promoting cavitation in said zone during reciprocatory

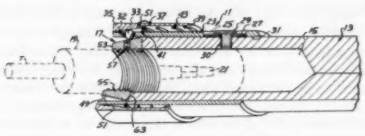


movements of the piston, said frusto-conically shaped area having recesses therein for establishing turbulence in said zone.

3,851,890
QUICK CHANGE SPINDLE ADAPTER AND NUT ASSEMBLY

Theodore M. Smith, Detroit, Mich., assignor to Theodore M. Smith Trust, Lucille G. Smith, and Theodore M. Smith (trustees)

Filed Apr. 21, 1972, Ser. No. 246,269
Int. Cl. B23b 31/04
U.S. Cl. 279—75 10 Claims



1. A quick change adapter for a power rotated spindle having a bore adapted to receive a tool holder;

a cylindrical body having a uniform bore mounted upon and secured to said spindle and projecting forwardly thereof;

a forwardly retractable spring biased sleeve movably mounted on said body and including a rearwardly and outwardly tapered inner wall portion;

and an internally threaded nut adapted to threadedly receive said tool holder, projected into said body and bearing against said spindle; its outer surface being straight axially;

there being a series of spaced balls nested in said body; portions of said balls projected radially inward retainingly engaging said nut and projected radially outward for operative engagement with said tapered inner wall portion, the tapered inner wall of the sleeve converging relative to the nut surface providing a cooperating wedging action of the balls between the nut surface and the sleeve inner wall for the purpose of anchoring said nut and tool holder within said body, and whereby forward manual retraction of said sleeve releases said balls facilitating assembly to and manual removal of said tool holder and nut from said body.

3,851,891
CART CONVERTIBLE FROM WHEEL TO SKID TRANSPORT

William C. Liu, Bronx, N.Y., assignor to Raymond Lee Organization, Inc., New York, N.Y., a part interest

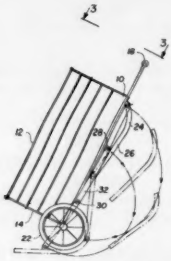
Filed Mar. 7, 1973, Ser. No. 338,764
Int. Cl. B62b 13/18
U.S. Cl. 280—11 2 Claims

1. A cart which can be wheeled over hard surfaces and which can be converted to slide over soft surfaces, said cart comprising:

a frame having a bottom, sides, open top and closed bottom; wheel means secured to the bottom of the frame at the bottom end, said means including a horizontal axle extending transversely across the frame with vertical wheels at each end;

a generally flat skid member having an upwardly curved front edge, said member having a width essentially the same as the overall length of the wheel means; and

manually operable linkage means secured to the member and the bottom of the frame, the linkage means including



a rod parallel to the axle and secured to the bottom and linkage pivotally secured to opposite sides of the rod, and to opposite sides of the member, the linkage means having a first position at which the member is disposed between said bottom and the bottom of the wheels with the front edge retracted away from the wheels whereby the cart can be moved on wheels, the linkage means having a second position at which the member is lowered and disposed under the wheels and the cart can be slid over sand and the like.

3,851,892

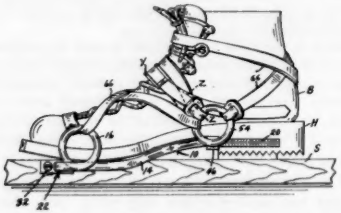
TOURING SKI BINDING

Richard E. Swenson, 1716 Vermilion Rd., Suluth, Minn. 55803

Filed Apr. 2, 1973, Ser. No. 346,896

Int. Cl. A63c *9/10*

U.S. Cl. 280—11.35 Y **4 Claims**



1. A touring ski binding for attaching a boot to a ski comprising:

a. a frame for receiving a boot therewith including first and second substantially straight side arms, extending longitudinally on each side of the ski, each having a right angle threaded portion, extending transversely of the ski, at the forward end thereof and a free end at the rear,

b. said frame also including a front loop adjacent each of said right angle portions extending upwardly in a generally longitudinal plane for engagement of a boot therebetween adjacent the toe thereof,

c. threaded socket means for mounting transversely on each side of the ski and for threadedly and pivotally receiving the threaded right angle portions of the side arms for pivotal and adjustable lateral connection of the frame to the ski.

d. a rear loop for each of said side arms, extending upwardly in a generally longitudinal plane,

e. means threadedly mounting said rear loops on said side arms for adjustment longitudinally of the arms, said front and rear loops receiving straps which hold the boot between the loops of the frame.

3,851,893

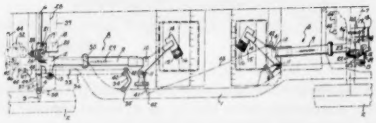
VEHICLE BANKING ARM CONSTRUCTION

Joachim Kolbe, 5126 Haskell Ave., Encino, Calif. 91316

Filed July 23, 1973, Ser. No. 381,991

Int. Cl. B60g *7/04*

U.S. Cl. 280—112 A **10 Claims**



1. In a vehicle of the class described, having a superstructure, a banking support for the superstructure connecting the superstructure at its forward end to a wheel spindle carrying wheel supported rigid front axle structure and at its rearward end to a rigid wheel supported rear axle housing structure, said banking support comprising a plurality of pairs of cooperating roll banking arms, each arm including a longitudinally extending torsionally operated resilient spring means connected by a separate support member and a ball and socket joint at one end to the superstructure and at the other end to the respective rigid axle structure, a side lever arm forming a part of said separate support member and bearing at its end against a resilient multiturn cushion of polyurethane based material placed near the outer end of the resilient spring means with the ball joint and the multiturn cushion placed a selected distance longitudinally of the vehicle from the related axle structure, and a side lever forming a part of the respective support member and bearing at its end againat a resilient multiturn cushion of polyurethane based material supported by the superstructure, each rigid transversely extending axle structure having a predetermined orientation as appearing in side view during static loading of the superstructure by means of a torque control pivot pivotally interconnecting the related axle structure and at least one of its related banking arms to secure and control said orientation of the related axle structure and to carry the axle torque pressures to the superstructure through said resilient means, wherein the improvement comprises the placing of said superstructure side lever carrying at its end the related multiturn cushion, into a position extending diagonally toward the median section of the vehicle and beyond the corresponding end of said spring means a length of about one-third to one-half of the distance between the respective axle supported and superstructure supported banking arm ball and socket joints, to secure elongation of the banking arm for improved space use within the vehicle superstructure.

3,851,894

CONNECTOR

Henri J. St. Pierre, 39 Yarmouth Rd., Nashua, N.H. 03060

Filed May 30, 1973, Ser. No. 365,069

Int. Cl. B60d *1/10, 3/00*

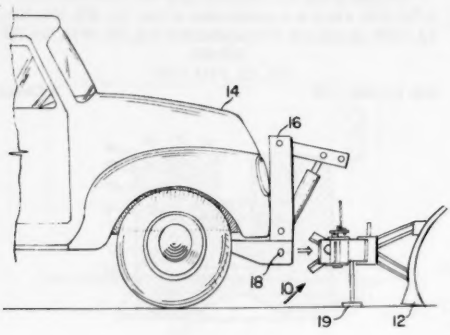
U.S. Cl. 280—460 R **8 Claims**

1. A connector for attaching an implement to a vehicle having an attaching shaft thereon, comprising:

a main frame having a fork on either side thereof and adapted to receive an attaching shaft;

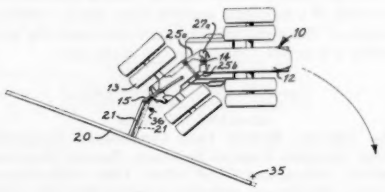
a pair of lock plates, each having a hole therein adjacent the closed end of the fork and disposed outside said forks;

means for laterally biasing said lock plates against said forks such that forces applied to the inner portions of said lock plates by an attaching shaft against said biasing means will



cause outward lateral movement of said lock plates; and means for opening said lock plates to permit release of the attaching shaft.

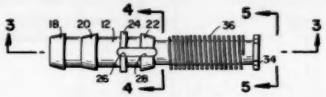
3,851,895
DRAWBAR STEERING ATTACHMENT FOR ARTICULATED TRACTORS
Maurice E. Davis, Rt. 2, Box 136, Moscow, Idaho 83843
Filed May 21, 1973, Ser. No. 361,969
Int. Cl. B62d *13/00*
U.S. Cl. 280—467 **10 Claims**



8. An attachment for tractors of the type having a front wheel-supported section and a rear wheel-supported section hinged to one another about a vertical steering axis, articulated steering means for steering the tractor by forcibly pivoting the front and rear sections relative to one another about the steering axis, and a rearwardly extending drawbar pivotably mounted to the rear section about a vertical drawbar axis, said attachment comprising:

a flexible cable having a portion thereof extending from one cable end mounted to the front tractor section, around a forward sheave rotatably mounted about an axis parallel to the steering axis to the rear tractor section, around a rearward sheave rotatably mounted to the rear tractor section about an axis parallel to the steering axis and laterally spaced from the drawbar, to a rearward end pivotably mounted to the drawbar at a location rearward of the drawbar axis.

3,851,896
IN-LINE EMITTER FOR HOSE
Donald O. Olson, 5885 Darmouth St., Chula Vista, Calif. 92010
Filed Sept. 24, 1973, Ser. No. 399,866
Int. Cl. F16l *55/00*
U.S. Cl. 285—14 **4 Claims**



1. A flow restricting emitter of the kind used in irrigation, said emitter comprising,

a one-piece tubular member having a relatively large diameter inner bore,

a first end insertable within the end of a first hose section, a second end insertable within the end of a second hose section,

a radially extending stop flange on the outer surface of the tubular member at the juncture of the first and second ends and having a first side surface engageable with the end of the first hose section and a second side surface engageable with the end of the second hose section to thereby prevent the hose sections from being pushed too far over either end of the tubular member,

hose retaining means on the outer surface of the tubular member for retaining the first and second hose sections in place on the tubular member,

radially extending flow restricting means formed on the outer surface of said first end and having an outer periphery engageable with the inner surface of the first hose section to define a flow passageway of extended length and restricted cross-sectional area between the outer surface of the first end of the tubular member and the inner surface of the first hose section,

inlet means for conducting fluid from the first hose section to the inlet of the passageway, and

outlet means for conducting fluid from the outlet of the passageway and between the adjacent ends of the hose sections,

said outlet means including a slot extending radially through the stop flange,

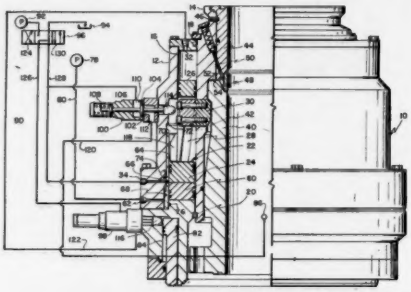
said hose retaining means include first barb means on said first end and second barb means on said second end and wherein the first barb means are located at the downstream end of the flow passageway between the end of the flow passageway and said stop flange and including a radially extending slot formed in the first barb means and aligned axially and radially with the slot in the stop flange.

3,851,897
WELL CONNECTOR
Andre L. Piazza, Houston, and Ado N. Vujasinovic, Humble, both of Tex., assignors to The Rucker Company, Houston, Tex.
Filed May 24, 1973, Ser. No. 363,344
Int. Cl. F16l *35/00*
U.S. Cl. 285—18 **9 Claims**

1. In a connector for connecting and disconnecting two sections of a drilling system in which one section includes a locking notch and the second section includes a double acting piston having sealing means and connected to and moving a locking lug into and out of said locking notch on reciprocal movement in a cylinder having a first port on one side of the piston for admitting fluid to move the piston in a direction to connect the sections and a second port on the second side of the piston for admitting fluid to move the piston in a direction

disconnecting the sections, the improvement of a secondary disconnect system comprising,

a secondary disconnecting piston having sealing means and positioned in said cylinder on a side of the second port opposite the double acting piston, and



a third port in the cylinder positioned behind the secondary piston for admitting fluid for moving the secondary piston and the double acting piston in a direction for disconnecting the sections.

3,851,898

PIPE CONNECTING DEVICE FOR SUBMERSIBLE PUMP

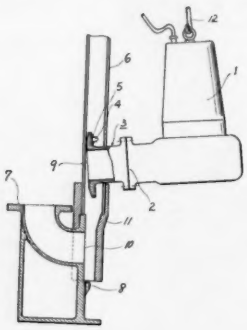
Eiichi Ihara, Wakayama, Japan, assignor to Elepon Kogyo Kabushiki Kaishi, Osaka Pref., Japan

Filed Dec. 13, 1973, Ser. No. 424,619

Claims priority, application Japan, Dec. 19, 1972, 47-146097

Int. Cl. F16l *37/26*

U.S. Cl. 285—24 **1 Claim**



1. A pipe connecting device for a submersible pump comprising a pipe connecting member fixed to the outlet of a submersible pump, said pipe connecting member being provided with a flange at the leading end thereof, a plurality of adjusting screws extending through said flange of said pipe connecting member and projecting toward said outlet of said submersible pump, guide means for said pipe connecting member disposed at both sides of and operatively connected to a liquid delivery pipe, setting arms connected to the lower end of said guides and to said liquid delivery pipe, said setting arms being tapered in the area thereof opposite to the upper portion of the joint face of a rear edge flange of said liquid delivery pipe for contact by said adjusting screws, and suspension means for suspending said pump in a forward inclining position thereby to permit said pipe connecting member to be aligned with said liquid delivery pipe.

3,851,899

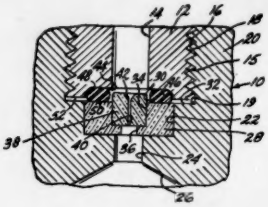
MEANS FOR SEALING FITTINGS AND NOZZLE ASSEMBLIES AT EXTREMELY HIGH FLUID PRESSURES

Norman C. Franz, 1203-4665 W. 10th Ave., Vancouver 8, British Columbia, Canada

Division of Ser. No. 163,456, July 16, 1971, Pat. No. 3,705,693, which is a continuation of Ser. No. 876,301, Nov. 13, 1969, abandoned. This application Aug. 28, 1972, Ser. No. 283,971

Int. Cl. F16l *17/00*

U.S. Cl. 285—95 **3 Claims**



1. In a high pressure fitting, the combination including a pair of tubular elements each having a body defining a fluid passageway, said bodies having spaced confronting surfaces, an annular elastic sealing member disposed between and engageable with said confronting surfaces having at least an inside portion exposed to said fluid passageways, and means for mechanically joining said bodies together forming a joint which allows high pressure fluid leakage between the spaced confronting surfaces of said bodies to the joint between the joining means and the tubular elements without the sealing member whereby said confronting surfaces engage said sealing member with a moderate compression comparable to a finger tightening of a threaded joint between the tubular elements and joining means, and said tubular elements, sealing member and joining means define a space between the spaced confronting surfaces of the tubular elements deforming the sealing member adjacent its outer periphery towards the joint between the joining means and the tubular elements upon application of a high fluid pressure from about 10,000 to in the order of 70,000 pounds per square inch inside the tubular elements to produce a fluid tight seal of the joint.

3,851,900

SEALING DEVICES

Andre Alphonse Mederic Leon Camboulives, Savigny-Sur-Orge; Theophile Francois Le Maout, Cesson; Marc Roger Marchi, Melun, and Roger Alfred Jules Vandenbroucke, Antony, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Sept. 14, 1973, Ser. No. 397,354

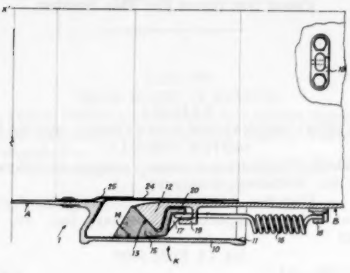
Claims priority, application France, Sept. 15, 1972, 72.32848

Int. Cl. F16l *21/00*

U.S. Cl. 285—231 **11 Claims**

1. Sealing device designed for fitting to a conduit through which a fluid passes in operation, the said conduit being composed of at least two sections of conduit which are axially consecutive and articulated to one another, the said sealing device being of the type comprising, in the zone of junction of two consecutive conduit sections, a first abutment surface integral with one of said two sections and oriented in such manner as to be capable of taking a thrust having a component parallel to the axis of the conduit, a second abutment surface integral with the other of said sections and oriented in such manner as to be capable of taking a thrust having a component normal to the axis of the conduit, and a sealing ring disposed coaxially with said conduit in the immediate vicinity of said abutment surfaces, in which the said sealing ring comprises a

ring of variable peripheral length and the said sealing device moreover comprises a guide ring, disposed coaxially with the conduit and having an oblique face turned towards and located in the immediate vicinity of said sealing ring, and means for applying said oblique face of the guide ring and said sealing



ring resiliently against one another in such manner as to urge said sealing ring resiliently both to shift parallel to the axis of the conduit and to vary in peripheral length, and thus to apply said sealing ring simultaneously against said first abutment surface and said second abutment surface.

3,851,901

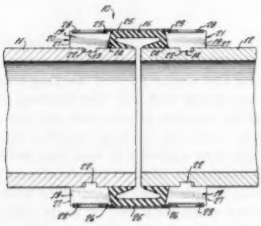
MECHANICAL PIPE COUPLINGS

Cecil M. Sills, 530 Catalina Rd., Fullerton, Calif. 92635

Filed Oct. 17, 1973, Ser. No. 407,308

Int. Cl. F16l *17/00*

U.S. Cl. 285—112 **14 Claims**



1. A pipe coupling for providing a fluid-tight joint between two abutting pipe ends, each of said pipe ends having an annular groove in the outer surface thereof, comprising:

two pairs of identical, semicircular, locking rings, each locking ring having an inwardly projecting tongue adapted to extend into said grooves in said pipe ends and an annular groove in the outer surface thereof, one pair of said rings being adapted to surround one of said pipe ends and the other pair of said rings being adapted to surround the other of said pipe ends;

a resilient, annular, sealing gasket positioned between said pairs of locking rings and being positionable around said abutting pipe ends;

an elongate, planar, flexible, connecting shield positioned around said locking rings and said sealing gasket, the width of said connecting shield being approximately equal to the combined width of said sealing gasket and said pairs of locking rings, the opposite ends of said connecting shield overlapping; and

a pair of hose clamps positioned around the sides of said connecting shield, said clamps being tightenable to secure said sides of said connecting shield in said grooves in said pairs of locking rings to connect said locking rings and said pipe ends together.

3,851,902

DISCONNECTIBLE PIPE UNION

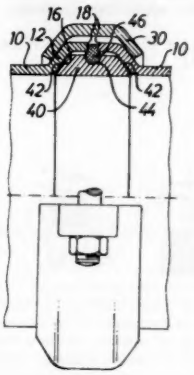
Klas Robert William Robinson, Lovangsvagen 37, 183 30 Taby, Sweden

Continuation of Ser. No. 289,527, Oct. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 46,252, June 15, 1970, abandoned. This application Mar. 18, 1974, Ser. No. 451,789

Claims priority, application Sweden, Nov. 11, 1971, 14472/71; May 13, 1970, 6545/70

Int. Cl. F16l *21/06*

U.S. Cl. 285—334.2 **4 Claims**



1. A disconnectible pipe union, comprising a pair of annular collars one on each of the pipe ends to be joined, said collars being flared so as to increase in diameter in a direction towards the medial plane of the joint to form an inwardly facing front face and an outwardly facing back face, each said collar terminating in an outer edge portion having a relatively sharp corner, the sharp corners on said pair of collars substantially confronting one another, a segmented clamping ring having a groove on the radially inner face thereof the sidewalls of which groove converge at an angle corresponding to the angle of convergence of the back faces and engage said back faces, means for tightening said clamping ring, whereby when said clamping ring is tightened, the groove side walls subject the back faces of the collars to a camming action which urges the pipe ends axially towards each other and brings the outer edge portions of the collars near one another, a stiff but resilient primary sealing ring disposed between the front faces of the two collars, said primary sealing ring having a cross sectional shape so as to substantially occupy and fill the axial space defined between said front faces to engage each front face

along a circumferential line contact area thereby to provide a narrow sealing contact zone between each side face of the sealing ring and each of said front faces, the side faces of the primary sealing ring extending at an angle relative to one another whereby the primary sealing ring is subjected to both axial and radial compression when the collars are sealingly clamped thereagainst by the clamping ring, the primary sealing ring being provided with a central peripherally extending outwardly opening groove on the outer peripheral surface thereof, and a secondary sealing ring of elastomeric material seated within said groove and having a part thereof projecting outwardly from said groove such that said part sealingly engages both said outer edge portions of the collars, said clamping ring causing the opposed sharp corners to project into the projecting part of said secondary sealing ring on opposite sides thereof, whereby the projecting part of the secondary sealing ring is deformed so as to extend into the space between and sealingly engage the opposed outer edge portions of the collars.

3,851,903

COUPLER FOR CONNECTING TUBULAR MEMBERS

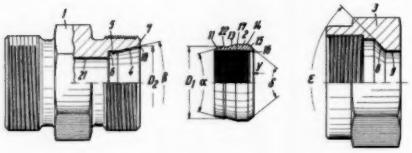
Clemens Nienhaus, Lohmar; Rudolph Pieper, Konigswinter, and Hubert Eikenbusch, Augustin, all of Germany, assignors to Jean Walterscheid GmbH, Trier, Germany

Filed Sept. 13, 1973, Ser. No. 396,690

Claims priority, application Germany, Sept. 13, 1972, 2244862

Int. Cl. F16l *17/02, 19/06*

U.S. Cl. 285—341 **5 Claims**



1. A threaded coupling for tightly connecting tubular members and comprising an element having external threads on one end thereof and a bore therethrough with a conical surface (**4**) at one end of said bore, an annular nut having an internal thread at one end of its bore and adapted to be screwed onto said element, said nut bore comprising a first cylindrical portion inwardly of said internal threads continuing into an inwardly tapering conical surface (**8**) and a second cylindrical portion (**9**) having a diameter greater than the tubular member being connected, a clamping ring adapted to be slid over the tubular member and to be retained between said element and said nut and having outer conical surfaces at both its element and nut ends, the element end conical surface (**11**) of said ring having a smaller angle of taper (α) than the nut end conical surface (**15**) on the ring and there being annular grooves in the bore of the ring, the taper angle (α) of said conical surface (**11**) being greater than the taper angle (β) of element conical surface (**4**) and the maximum diameter of said ring conical surface (**11**) being approximately equal to or less than the largest diameter of said element conical surface (**4**), there being a second conical surface (**12**) on said ring from the maximum diameter of said conical surface (**11**) and tapering inwardly and connecting to a third conical surface (**13**) tapering outwardly to a peripheral cylindrical surface (**14**), said nut end conical surface (**15**) on said ring having an angle of taper (δ) which is less than the taper angle (ϵ) of nut bore conical surface (**8**).

3,851,904

Patent Not Issued For This Number

3,851,905

LATCHING MECHANISM FOR SLIDING DOORS IN A MOTOR VEHICLE

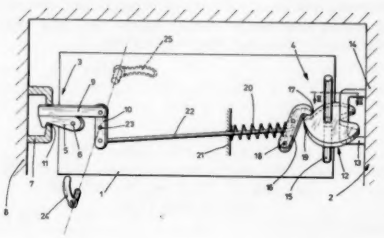
Horst Klebba, Weyhausen, Germany, assignor to Volkswagenwerk AG, Wolfsburg, Germany

Filed Dec. 26, 1973, Ser. No. 427,570

Claims priority, application Germany, Dec. 27, 1973, 2263421

Int. Cl. E05c *9/00*

U.S. Cl. 292—11 **6 Claims**



1. A latching mechanism for a sliding door preferably for motor vehicles comprising a first latching means mounted on the door at one end region thereof, locking bolt means on a doorframe cooperating with said first latching member when said first latching member is actuated and the door is in its closed position, a second latching member mounted at the other end of the door opposite to said first latching member, a locking bolt means mounted on the doorframe adjacent said second latching member and cooperating with said second latching member when said door is in its closed position, a safety lever adapted to be forced in a position securing said second latching member in a latching position when the door is in its closed position, means for coupling said first latching member and said safety lever in a safe position when said door is closed, said first latching member including a swivel latch plate means comprising a latching portion cooperating with said locking bolt when said door is in closed position and mounted for pivotable movement for engaging said locking bolt means in the closed position of said door, said swivel plate means including a camming portion and a main ratchet portion, said first latching member further including a pawl means pivotably mounted on said door and secured to said coupling means and adapted for riding over said camming portion during the release position of said door and entering into said main ratchet portion during the latched position of said door, spring means holding said pawl means in contact with said camming and said main ratchet portion, said coupling means coupling said pawl operably with said safety lever and forcing

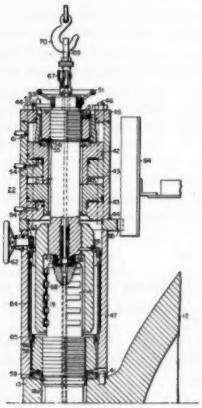
said safety lever into a latched position with said first latching member when said pawl is in said main ratchet, the movement of said pawl into said main ratchet being in synchronism with the entry of said safety lever means into said latched position with said first latching member.

3,851,906

HEAD CLOSURE SYSTEM

Erling Frisch, Pittsburgh, and Harry N. Andrews, Export, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 13, 1971, Ser. No. 179,703
Int. Cl. E05c 5/04
U.S. Cl. 292—256.73 21 Claims



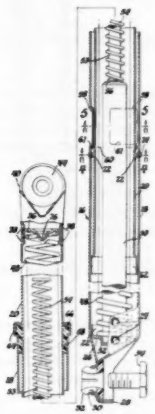
1. A head closure system for a generally cylindrical pressure vessel and a closure head having outwardly extending mating flanges with a plurality of vertically aligned holes therein, comprising studs rotatably disposed in said holes to retain the head on the vessel, each stud having a plurality of separate parallel horizontally extending interrupted threads at its lower portion and also at its upper portion, each hole in the vessel flange having threads therein corresponding to the threads at the lower portion of each stud, said threads being aligned in vertical sections with gaps between sections having a greater angular extent than the angular extent of the thread sections, said stud being rotatable to align the thread sections on the studs with the thread sections in the vessel flange, portable tensioning means adapted for mounting on said closure head for applying tension on each stud to retain the head on the vessel, and said tensioning means having threads therein corresponding to the threads at the upper portion of the stud for attaching the tensioning means to the stud.

3,851,907

TELESCOPIC COUNTERBALANCE

Bela Sandor, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 26, 1973, Ser. No. 354,702
Int. Cl. E05c 17/30
U.S. Cl. 292—262 8 Claims



1. A telescopic counterbalance for a closure movable between open and closed positions relative to a support comprising, in combination, a pair of telescopic annular members movable inwardly and outwardly of each other, means securing the outer ends of the members respectively to the support and the closure, resilient counterbalance means seating between the members to bias the members in a telescopic outward direction and bias the closure to an open position, booster spring means mounted on one of the members, and abutment means mounted on the other member, the booster spring means being normally in a free position and being engaged and compressed by the abutment means only during final inward telescopic movement of the members to provide a pop-open force cooperating with the resilient counterbalance means in initially biasing the closure to a partially open position.

3,851,908

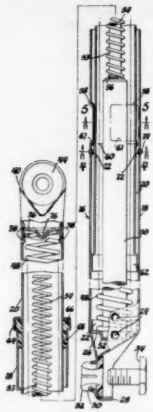
TELESCOPIC COUNTERBALANCE

Howard D. Hester, Romeo, and Bert R. Wanlass, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 11, 1973, Ser. No. 368,857
Int. Cl. E05c 17/30
U.S. Cl. 292—262 2 Claims

1. A telescopic counterbalance for a closure movable between open and closed positions relative to a support comprising, in combination, a pair of telescopic annular members movable telescopically inwardly and outwardly of each other and adapted to have their outer ends respectively secured to the closure and to the support, means biasing the members in

a telescopic outward direction to bias the closure to an open position, each telescopic member including bearing means adjacent the inner end thereof and stop means spaced substantially from a respective bearing means, the bearing means of each member slidably bearing on the other member as the members move telescopically relative to each other to provide spaced bearing areas increasing the bending strength of the



telescopic counterbalance, the stop means of the members being engageable with each other upon movement of the members in a telescopic outward direction to provide a fixed stop delineating the extended position of the members and located in spaced relationship to the bearing means intermediately thereof to function as an additional bearing point for increased bending strength.

3,851,909

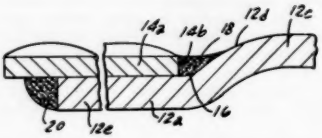
VEHICLE BUMPER CONSTRUCTION AND METHOD OF MAKING SAME

Carl L. Kalitta, Adrian, Mich., assignor to Dura Corporation, Southfield, Mich.

Division of Ser. No. 237,711, March 24, 1972, Pat. No. 3,790,200. This application Feb. 1, 1973, Ser. No. 328,766

Int. Cl. B60r *19/00, 21/14*

U.S. Cl. 293—70 **4 Claims**



1. A method of constructing a bumper having a bar member which has a body portion with a lip extending at an angle to the body portion and a platform member secured to a portion of the lip comprising the steps of

forming an offset at a free edge of the lip to provide a shoulder spaced from the free edge of the lip,

positioning an edge portion of said platform member in overlapping relation on said offset to form a trough between an edge of said platform member and the shoulder of said offset,

rigidly securing said bar member and said platform member to form an assembled bumper,

applying at least one coating of protective material to the assembled bumper, and

filling the trough with a sealer having the same color as the last applied coating of protective material so that rust which may form between the offset and overlapping platform is prevented from bleeding onto a show surface of the bumper.

3,851,910

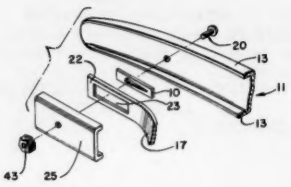
AUTOMOTIVE BUMPER AND ENERGY ABSORBING MEMBER THEREFOR

Nathan Levenberg, 2 Windsor Place, Lynbrook, N.Y. 11561

Filed Apr. 10, 1973, Ser. No. 349,720

Int. Cl. B60r *19/04;* **F16f** *1/36*

U.S. Cl. 293—89 **13 Claims**



1. An energy-absorbing member having a predetermined geometrical configuration defining at least a first pair of spaced-apart outer surfaces determining the thickness of said member and an opening in said member extending between and through said first pair of surfaces, said opening having a first portion and a second portion, said first portion adapted to receive a translatable member therein which under a predetermined condition is capable of being translated generally transversely and laterally relative to said first pair of surfaces from said first portion to said second portion of said opening, said second portion of said opening defining a second pair of opposed surfaces for frictionally engaging the periphery of said translatable member to reduce the kinetic energy thereof, said second pair of surfaces extending generally transversely relative to said first pair of surfaces.

3,851,911

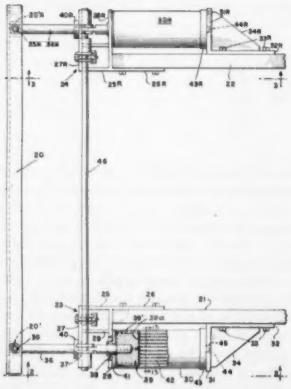
IMPACT BUMPER ABSORBING ASSEMBLY

Ralph J. Brooks, Langhorne, Pa., assignor to Andrew R. Klein, Philadelphia, Pa.

Filed Aug. 27, 1971, Ser. No. 175,668

Int. Cl. B60r *19/06;* **B61f** *19/04;* **F16d** *63/00*

U.S. Cl. 293—84 **11 Claims**



1. A vehicle bumper mounting assembly for dissipating the energy generated by a collision comprising a bumper carrying

element, rods, one at each side of said vehicle, mounting said element on the vehicle, said rods being axially movable lengthwise of the vehicle; a torsion bar mounted crosswise of the vehicle and having means to prevent the rotation of one of its ends, and means carried near its other end for engaging one of said rods, said means being adapted, upon movement of said rod, to impart rotation to the said other end of the torsion bar; housings rigidly mounted along the sides of the vehicle, each adapted to receive, confine, and support a mass of crushable material, said housings each also slidably enclosing head structure mounted to that end of the rod within it which is remote from the bumper, said head structure being movable under stress to crush said crushable material against the rear wall of its housing.

3,851,912

VEHICLE WITH FLAT FRAME STRUCTURE

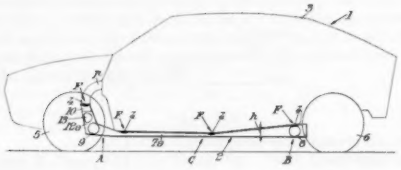
Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Feb. 20, 1973, Ser. No. 333,658

Claims priority, application France, Feb. 28, 1972, 72.06711

Int. Cl. B62d *21/02, 27/04*

U.S. Cl. 296—35 R **11 Claims**



1. Vehicle comprising a chassis including a substantially flat, relatively thin, frame on which are fixable wheel-mounting means at front and rear zones respectively, a body, elastic elements connecting said body to said chassis and adapted to filter noise and vibration which may be transmitted from the chassis to the body, said frame having self-rigidity in its plane, the body being substantially undeformable by torsion forces around the longitudinal direction of the vehicle and flexion forces under vertical load, said elastic connecting elements between the body and the chassis being arranged to prevent practically any vertical relative displacement and to permit slight relative longitudinal movement between the chassis and the body, the assembly being such that the body, fixed to the chassis resists buckling of the chassis, the smallest cross-sectional height of the chassis, between the two zones of attachment of the wheel-mounting means being less than a fortieth (**1/40th**) of the longitudinal distance separating said front and rear zones.

3,851,913

TRACTOR CAB WITH COMBINED TILT PIVOT AND RESILIENT MOUNTS

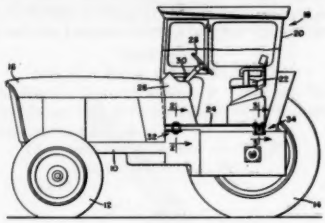
Harold Monroe Knoth, Davenport, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 1, 1973, Ser. No. 395,499

Int. Cl. B62d *23/00*

U.S. Cl. 296—35 R **2 Claims**

1. A tractor and operator's station therefor including a cab, means pivotally mounting the cab on the tractor for swinging between normal and tilted positions, an operator's console at least partially within the cab and detachably connected to the cab to combine therewith to form a unitized console-cab assembly during normal operation of the tractor and to be detached from the cab to remain with the tractor when the cab is tilted, and separable resilient mounting means spaced from the pivot means and connecting the assembly to the tractor in vibration-isolated relation to the tractor, characterized in that the pivot means comprises a support on the tractor, an intermediate part pivoted to the support, and an elastomer element



connected to the intermediate part and to the cab to complete the vibration-isolated mounting of the assembly during normal tractor operation yet allowing tilting of the cab relative to the tractor and console when the mounting means is separated.

3,851,914

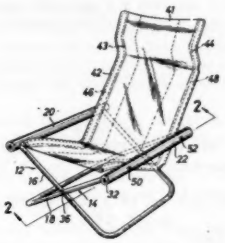
COLLAPSIBLE CHAIR

Takeshi Nii, 12, Nishifunabacho 1-chome, Tokushima-shi, Japan

Filed Oct. 30, 1972, Ser. No. 301,949

Int. Cl. A47c *4/28*

U.S. Cl. 297—45 **6 Claims**



1. A collapsible chair comprising: a pair of frameworks each having legs and an arm pivotally mounted on the upper end of said legs, said frameworks being coupled together by a connecting means so as to permit folding of the frameworks inwardly along the center line of said chair;

a thin flexible membrane having folds at each of its sides defining elongated tubular formations; and

a pair of rods inserted into said elongated tubular formations to carry said flexible membrane therebetween, said rods being curved at an angle to form integral seat and backrest portions with said flexible membrane stretched therebetween and being fixed to the inside of said arms of said frameworks in at least two places.

3,851,915

FOLDING AND STACKING CHAIR

Ismael S. Rodrigo, Buenos Aires, Argentina, assignor to Rodrigo Disenos S.A.C.I., Buenos Aires, Argentina

Filed July 30, 1973, Ser. No. 383,542

Claims priority, application Argentina, Aug. 7, 1972, 243465

Int. Cl. A47c *4/44*

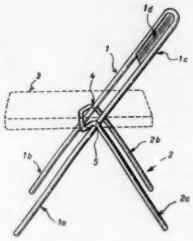
U.S. Cl. 297—56 **9 Claims**

1. A folding and stacking chair comprising:

a first U-shaped member having two parallel arms and a cross member at one end thereof, the open ends of said

arms serving as the front legs of the chair and the cross member serving as the back of the chair;

a second U-shaped member having two parallel arms and a cross member at one end thereof, the open ends of said arms serving as the rear legs of the chair, said second U-shaped member being articulated to said first U-shaped member such that said second U-shaped member is pivotable about a fixed axis passing through the arms of said first U-shaped member; and



a seat articulated to said first U-shaped member so as to be pivotable about said fixed axis, wherein said cross member of said second U-shaped member is parallel to said axis and is spaced therefrom and wherein said cross member supports said seat in a generally horizontal position when the chair is in an unfolded position.

3,851,916

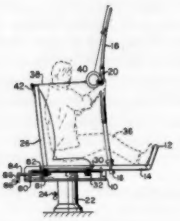
BIG GAME FISHING CHAIR

Orpheus F. Quartullo, 230 Nurmi Dr., Ft. Lauderdale, Fla. 33301

Filed Apr. 16, 1973, Ser. No. 351,193

Int. Cl. A47c 7/62

U.S. Cl. 297—188 **6 Claims**



1. A big game fishing chair including a base, a socket pivotally mounted on the base to receive the butt end of a fishing rod, a foot rest on the base, a chair slidably mounted on the base and movable to and from the socket and foot rest, restraining means releasably securing the chair to said fishing rod at a point spaced vertically of the socket to establish a fixed distance therebetween, movement of said chair away from said socket and foot rest causing said fishing rod to be moved about its pivotal mounting pulled in the direction of movement by said restraining means.

3,851,917

INVALID CHAIRS

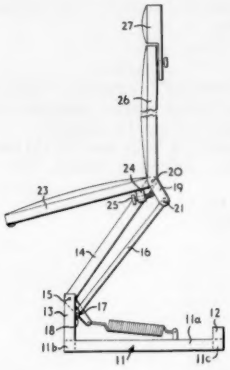
Bevan Graham Horstmann, and Frederick Reginald Vincent, both of Corsham, England, assignors to The Bath Institute of Medical Engineering, Somerset, England

Continuation-in-part of Ser. No. 203,699, Dec., 1971, abandoned. This application Mar. 29, 1973, Ser. No. 345,832

Claims priority, application Great Britain, Jan. 16, 1973, 02235/73

Int. Cl. A47c 1/02, 1/06, 1/12

U.S. Cl. 297—345 **6 Claims**



1. An invalid chair comprising:

a chair base;

a seat portion;

a back rest;

linkage operatively interconnecting the chair base, seat portion and back rest;

resilient means operatively connected between one end of said linkage and said base to urge the seat portion and back rest to raised positions and thereby assist an occupant in rising from a sitting position;

said linkage comprising a quadrilateral linkage operatively connecting the back rest to the chair base, said quadrilateral linkage including upper and lower links extending forward from the lower part of the back rest, said links having forward ends pivotally connected to the chair base, and rear ends pivotally connected to the back rest; the seat portion being pivoted to one of said back rest and said upper link, in the vicinity of the junction therebetween; and

a bell crank lever pivoted to said upper link intermediate the ends thereof, having one arm engaged with the underside of the seat portion and the other arm operatively connected to said lower link whereby movement of said quadrilateral linkage causes rotation of the lower arm whereby the upper arm also moves and lifts said seat portion with respect to said upper link.

3,851,918

CHAIR BACKREST RECLINING ASSEMBLY

Ralph B. Lay, Columbus, Ind., assignor to Cosco, Inc., Columbus, Ohio

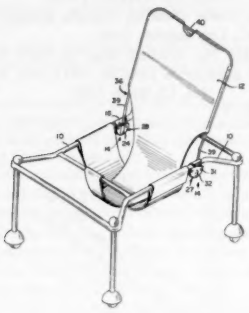
Filed Oct. 12, 1973, Ser. No. 406,084

Int. Cl. A47c 1/026

U.S. Cl. 297—357 **5 Claims**

1. A chair backrest reclining assembly, comprising a pair of supports mounted on the opposed sides of a chair, each such support comprising a first plate mounted on said frame and having a generally L-shaped slot formed therein, second and third plates rotatably connected to said first plate on the opposite sides thereof; and a backrest frame having a pair of

arms connected to said supports, each of the arms having its lower portion received between said first and second plates, and a finger on said lower portion slidably carried in said L-shaped slot and received in said third plate, said finger being movable in said L-shaped slot between a first position in which



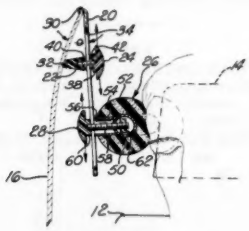
said back frame is in a generally upright position and a second position in which said back frame is in a reclining position, said second and third plates rotating with respect to said first plate during movement of said back frame between said upright and reclining positions.

3,851,919

AUTOMOBILE HEADREST

James P. Nagy, 6127 McKenzie Rd., North Olmstead, Ohio 44070

Filed Aug. 1, 1973, Ser. No. 384,485
Int. Cl. A47c *7/36*
U.S. Cl. 297—395 **7 Claims**



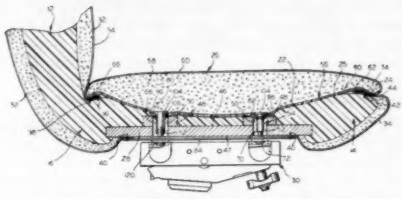
1. A vehicle headrest adapted to be supported by a window of a vehicle, said headrest comprising an elongated rigid bracket member, rigid hook means at one end portion of said rigid bracket member for engaging the top portion of the vehicle window and for supporting said rigid bracket member for pivotal movement toward and away from a major side surface of the window, head support means disposed on a first side of said rigid bracket member for engaging the head of an occupant of the vehicle, head support connector means for connecting said head support means to said rigid bracket member and for enabling the position of said head support means to be varied longitudinally along said rigid bracket member to adjust the position of said head support means relative to the top portion of the window to accommodate vehicle occupants of different sizes, and spacer means disposed on a second side of said rigid bracket member for engaging the major side surface of the window at a location disposed downwardly from the top portion of the window to hold said rigid bracket member and head support means outwardly from the major side surface of the window against the influence of force directed toward the major side surface of the window and applied against said head support means by the head of an occupant of the vehicle.

3,851,920

SHELL CHAIR CONSTRUCTION

Everett K. Harris, Geneva; William P. Anderson, North Aurora, and James W. Lannert, Oswego, all of Ill., assignors to All-Steel Inc., Aurora, Ill.

Filed July 23, 1973, Ser. No. 381,772
Int. Cl. A47c *1/12, 7/02*
U.S. Cl. 297—455 **6 Claims**



1. A shell chair comprising:
a molded shell defining seat and back portions,
said seat portion having molded in same a generally planar reinforcing seat board that is exposed on the underside of said seat portion and underlies the upper side of said seat portion,
said seat portion including said seat board being formed with a plurality of fastener receiving openings extending therethrough,
a seat pan seated on the upper surface of said seat portion and having cushion padding applied thereto, on the upwardly facing side thereof,
a headed tubular fastener element disposed in each of said openings and carried by said pan, with the respective fastener elements having their headed ends disposed in engagement with said surface of said seat pan,
said fastener elements being made fast to said seat pan,
a chair base including a seat attachment member defining a plurality of screw receiving openings aligned with said seat portion openings,
and a screw received in each of said screw receiving openings,
said seat board and said seat pan at each of said seat portion openings having a compression resisting insert interposed therebetween through which the respective seat portion openings extend,
said screws being turned to clamp the respective inserts between said seat pan and said seat attachment member to make said seat pan fast to said seat portion.

3,851,921

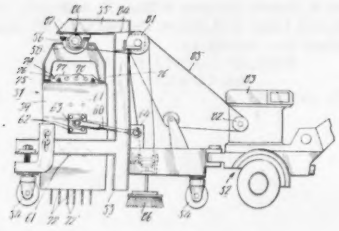
PAVEMENT SURFACE TREATING APPARATUS

Sumio Makishima, 67-3 Shinmachi 2-chome, Tokyo, Japan

Filed Jan. 4, 1973, Ser. No. 320,864
Claims priority, application Japan, Jan. 14, 1972, 47-5818; Oct. 23, 1972, 47-105331
Int. Cl. E01c *23/09*
U.S. Cl. 299—37 **5 Claims**

1. A pavement surface treating apparatus comprising a prime mover, a drive power transmission mechanism operatively connected to said prime mover to receive power from

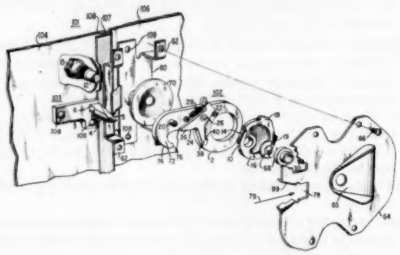
the prime mover and having a crank, and a pavement surface roughing mechanism being hung from said power transmission mechanism and operatively connected to said power transmission mechanism for vertical and reciprocal movement upon application of power from said transmission mechanism so as to strike against said pavement surface to rough the surface, said roughing mechanism comprising a base guide plate having a plurality of through holes, an upper adjustable guide plate positioned above said base plate and having a plurality of through holes in staggered relationship to said holes in the base plate, a plurality of resilient wire sections extending through said holes in the base and upper plates and an anchoring plate positioned above said adjustable upper plate for anchoring one end of said wire sections.



3,851,922
HOOK LATCH

Robert Gordon McCoy, Whippany, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Jan. 7, 1974, Ser. No. 431,032
Int. Cl. E05c *5/02*
U.S. Cl. 292—111 **5 Claims**



1. A latch comprising a sill pin; a rotary eccentric cam having a first shoulder on the periphery thereof; a hook member mounted on said cam and adapted to move into and out of engagement with said sill pin in response to a rotation of said cam to close and open said latch, respectively, a trigger rotatably mounted with respect to said hook member and having a lip thereon adapted to engage said first shoulder on said cam to prevent rotation of said cam to close said latch until said cam, said hook member and said sill pin are properly positioned with respect to each other, characterized in that said latch includes:

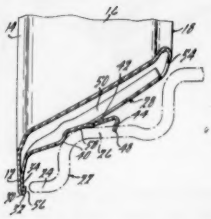
first means for maintaining said hook member in engagement with said sill pin until said lip has engaged said first shoulder and until said hook member has been substantially fully extended when said latch is being opened; and

second means for removing said lip from engagement with said first shoulder after said hook member has moved into engagement with said sill pin when said latch is being closed.

3,851,923
VEHICLE WHEEL TRIM

Hans R. Beisch, Essex, Ontario, Canada, assignor to Norris Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 146,082, May 24, 1971, Pat. No. 3,757,400. This application June 16, 1972, Ser. No. 263,711
Int. Cl. B60b *7/02*
U.S. Cl. 301—37 T **9 Claims**

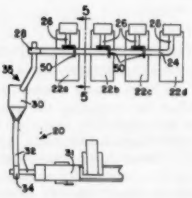


1. Wheel trim for a vehicle wheel, comprising: means defining a generally annular body adapted to overlie a portion of a vehicle wheel; means defining a plurality of circumferentially spaced reinforcing elements extending from and integral with the inner periphery of said body, said elements extending generally from said inner periphery to the outer periphery of said body, the free ends of said elements being rigidly affixed to said body adjacent the outer periphery thereof; retention means supported on said elements for removably retaining said body on the vehicle wheel; said body, said reinforcing elements and said retention means being formed from a single sheet of material and being integral with one another.

3,851,924
FIBER DISTRIBUTION APPARATUS

James H. Roberson, and Thomas C. Perry, Jr., both of Greenville, S.C., assignors to Crompton & Knowles Corporation, Worcester, Mass.

Filed Sept. 25, 1970, Ser. No. 75,400
Int. Cl. B65g *53/08, 53/36*
U.S. Cl. 302—28 **9 Claims**



1. Apparatus for selectively supplying fibers to a plurality of fiber processing machines comprising:

a. a source of fiber supply;

b. a conduit connected to said source of fiber supply;

c. a feed duct for each of said fiber processing machines connected to said conduit;

d. pneumatic means connected to said conduit between said source of fiber supply and said feed ducts for creating an air flow toward said feed ducts;

e. an electromechanical two-position valve located in said conduit between said source and said pneumatic means, said valve being effective in a first position to open said conduit to the atmosphere and to close said conduit to said source and effective in a second position to close said conduit to the atmosphere and open said conduit to said source;

f. electromechanical gating means for selectively directing said air flow from said conduit to any one of said feed ducts;

g. means for sensing a need for fibers in each of said feed ducts, said sensing means including a sensor switch associated with each of said feed ducts which is actuated by a need for fibers therein;

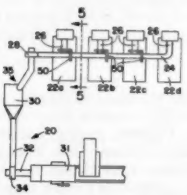
h. first timer switches, one for each of said feed ducts, which are connected in series with respective sensor switches of said sensing means, each of said first timer switches being effective for shifting said two-position valve to its second position or a period of time to initiate a feeding cycle when its corresponding sensor switch is actuated by a need for fibers; and

i. second timer switches synchronized with said first timer switches for controlling said gating means to pneumatically connect said conduit to the feed duct whose sensor switch initiates a feeding cycle for the entire time that said two-position valve is in said second position and for a period of time thereafter, whereby fibers are conveyed into a feed duct in which there was sensed a need for fibers for the period of time said two-position valve is in its second position followed by a purging air flow along said conduit and into said feed duct for a period of time thereafter.

3,851,925
FIBER DISTRIBUTION SYSTEM

James H. Roberson, Greenville, S.C., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Filed Sept. 25, 1970, Ser. No. 75,647
Int. Cl. B65g *53/08, 53/36*
U.S. Cl. 302—28 **4 Claims**



1. Apparatus for supplying textile fibers to a plurality of groups of fiber processing machines comprising:

a. a source of fiber supply;

b. a feed duct for each of said fiber processing machines;

c. a satellite conduit for each of said groups connected to respective feed ducts in its group;

d. an electromechanical two-position valve for each of said satellite conduits, each of said valves being effective when in a first position to open its conduit to the atmosphere and close its conduit from said source of fiber supply and effective in a second position to close its conduit from the atmosphere and open its conduit to said source of fiber supply;

e. pneumatic means for creating an air flow in each of said satellite conduits from their respective two-position valves towards their respective feed ducts;

f. electromechanical gating means associated with each of said groups for selectively connecting each of the feed ducts pneumatically to their satellite conduits; and

g. control means comprising:

1. means for sensing a need for fibers in each of said feed ducts, said sensing means including a sensor switch associated with each of said feed ducts which is actuated by a need for fibers;

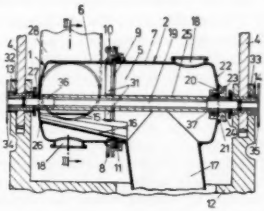
2. first timer switches, one for each of said feed ducts, which are connected in series with respective sensor switches of said sensing means, each of said first timer switches being effective for shifting its respective two-position valve to its second position for a first period of time to initiate a feeding cycle when its corresponding sensor switch is actuated by a need for fibers, said first timer switches being arranged so that only one of said two-position valves may be in its second position at any one time; and

3. second timer switches, synchronized with said first timer switches, for controlling said gating means so that a feed duct whose sensor switch initiates a feeding cycle will be pneumatically connected to its corresponding satellite conduit for the entire period of time that said two-position valve is in its second position and for a second period of time thereafter, whereby fibers can be supplied to a feed duct in one of said groups of machines for a first period of time and immediately thereafter a purging air can be directed to said feed duct for a second period of time while fibers are supplied to a feed duct in another of said groups of machines during said second period of time.

3,851,926
PIPE ARTICULATION

Walter Merz, Kuesnachi, Switzerland, assignor to Swiss Aluminium, Ltd., Neuhausen am Rheinfall, Germany

Filed Apr. 13, 1973, Ser. No. 351,088
Claims priority, application Switzerland, Apr. 14, 1972, 5583/72
Int. Cl. B65g *53/52*
U.S. Cl. 302—29 **9 Claims**



1. A pipe articulation, for use in changing the direction of flow of particulate solid materials in a conveyor for particulate solid materials, comprising an inlet duct, an outlet, and first and second housing parts defining a chamber, the housing parts being arranged to rotate relatively to each other about a substantially horizontal axis, the inlet duct intersecting the first housing part, whereby the particulate material is conveyed at relatively low velocity into said first housing part and the outlet being in the second housing part, said inlet duct and said outlet duct being at an angle relative to said horizontal axis whereby the particulate material is conveyed out of said pipe articulation through said outlet, in a direction different than the direction in which it was conveyed into said inlet duct, said inlet direction depending on the relative rotation of said housing parts, the inlet duct having a first fluidising floor, and the first housing part having a second fluidising floor, whereby the particulate matter may be maintained in a flui-

dised condition to facilitate conveyance through said pipe articulation.

3,851,927

APPARATUS FOR UNIFORMLY DISTRIBUTING MATERIAL DISCHARGED FROM A BLOWER PIPE LINE

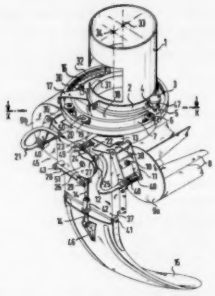
Ernst Weichel, Postfach 30, 7326 Geiningen, Germany

Filed May 21, 1971, Ser. No. 145,086

Claims priority, application Germany, May 22, 1970, 2024932

Int. Cl. B65g *65/32*

U.S. Cl. 302—60 **27 Claims**



1. Apparatus for uniformly distributing material issuing from a blower pipe line onto a storage surface, including support means arranged to be detachably connected to the discharge end of the pipe line, a deflecting flap connected to said support means and arranged to be positioned below and in the path of the material discharged from the pipe line, at lest one wind wheel arranged to be located in the path of the material discharged from the pipe line and driven by the discharge from the pipe line, means associated with said deflecting flap and said wind wheel and arranged for rotating said deflecting flap about the downward projection of the axis of the discharge end of the pipe line, said means including a cam disc for angularly displacing said deflecting flap about an axis transverse to the axis of the discharge end of said pipe line, wherein the improvement comprises that said support means depend downwardly from the discharge end of said pipe line, said deflecting flap having its upper end connected to said support means at a position spaced below the discharge end of said pipe line, a pair of said wind wheels arranged with their axes of rotation extending transversely of the axis of the discharge end of said pipe line and disposed in laterally spaced relationship and positioned on opposite sides of the axis of the discharge end of said pipe line, so that the radially outer peripheries of said wind wheels are spaced apart, said wnd wheels mounted on said support means for rotation in an annular path located in a plane below the discharge end of said pipe line and approximately perpendicular to the axis of the discharge end of said pipe line, said wind wheels extending forwardly from the upright plane containing the upper end of said deflecting flap toward the axis of the discharge end of the pipe line, and each of said wind wheels being in operative connection with said means for rotating said deflecting flap.

3,851,928

BRAKING SYSTEMS

Brian Colin Pagdin, Sutton Coldfield, England, assignor to GKN Transmissions, Limited, Birmingham, England

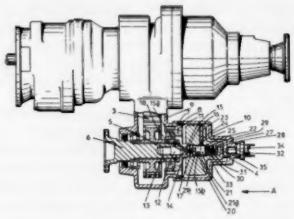
Filed May 30, 1973, Ser. No. 365,190

Claims priority, application Great Britain, May 30, 1972, 25170/72

Int. Cl. B60t *8/16*

U.S. Cl. 303—21 CG **5 Claims**

1. A vehicle anti-skid braking system including an inertial skid sensor comprising a flywheel mounted on a shaft for movement about and parallel to the longitudinal axis of the shaft, a sealed chamber containing a viscous fluid within the flywheel into which the shaft extends, the portion of the shaft within the chamber being provided with a piston which divides the chamber into two portions, a fluid passageway between said chamber portions incorporating a fluid flow restrictor, two sleeves encircling a portion of the shaft within the chamber, the sleeves being arranged in end to end configuration and adjacent ends of the sleeves being provided with co-operating cam surfaces, one sleeve being connected with the shaft and the other being in screw-threaded engagement at its outer periphery with an internally screw-threaded portion of the wall of the chamber so that the relative axial positions of said other sleeve and the flywheel can be adjusted, locking means carried by the flywheel in order to lock the flywheel and said other sleeve in a fixed axial relationship, and resilient



means biasing the co-operating cam surfaces into mutual engagement so that relative rotation between the shaft and flywheel causes the cam surfaces to displace the flywheel axially relative to the shaft, said axial movement of the flywheel relative to the shaft being damped by displacement of the viscous fluid from one portion of the chamber to the other via the flow restrictor, the sensor being arranged to be driven at a speed proportional to the speed of a braked wheel of the vehicle and arranged to extend substantially parallel to the longitudinal axis of the associated vehicle so that the axial movement of the flywheel caused by the tendency of the flywheel to over-run the shaft in response to a wheel deceleration in excess of a predetermined level indicating a skid condition is opposed by the linear inertia of the flywheel, said axial movement of the flywheel being arranged to reduce the braking torque exerted so as to relieve the skid condition.

3,851,929

BRAKING MECHANISM TENDING TO ELIMINATE LOCKING

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Mar. 7, 1973, Ser. No. 339,007

Claims priority, application France, Mar. 9, 1972, 72.8305

Int. Cl. B60t *8/02*

U.S. Cl. 303—21 F **8 Claims**

1. An anti-locking braking assembly for a vehicle which comprises:

a source of fluid under pressure;

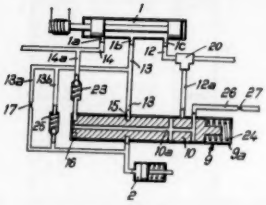
a receiving member means coupled to a brake of a wheel of said vehicle;

a sensing means detecting the dynamic state of said wheel;

a first conduit means including a control valve means responsive to said sensing means, said control valve means having an exhaust conduit means, said first conduit means capable of placing said receiving member means in fluid communication with said source of pressurized fluid via said control valve means;

a distributor means having two positions, said distributor means being disposed in said first conduit means between said control valve means and said receiving member means and dividing said first conduit means into first and

second portion means, said first portion means extending from said control valve means to said distributor means, said second portion means extending from said distributor means to said receiving member means, said distributor means comprising first and second guide means said first guide means enabling said distributor means to maintain a first stable position to provide fluid communication between said first and second portion means, said second guide means enabling said distributor to maintain a sec-



ond stable position whereby fluid communication between said portion means is interrupted upon detection by said sensing means of an abnormal state of said wheel as long as the pressure of said fluid is not appreciably decreased; and

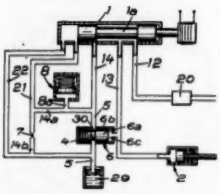
a second conduit means including a fluid flow limiter means connecting said first and second portion means of said first conduit means in shunt relationship with respect to said distributor means.

3,851,930

BRAKING MECHANISM HAVING AN ANTI-LOCKING SYSTEM

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Mar. 7, 1973, Ser. No. 339,009
Claims priority, application France, Mar. 9, 1972, 72.8306
Int. Cl. B60t *8/06*
U.S. Cl. 303—21 F **4 Claims**



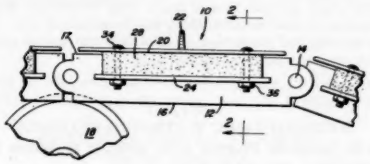
1. Improved braking mechanism having an anti-locking system for at least one wheel of a vehicle comprised of a source of fluid under pressure controlled by the driver, brake operator means receiving said fluid and connected to a brake of said wheel, a valve having two positions controlled by a means detecting abnormal deceleration of said wheel and able to place said brake operator means selectively in fluid communication with said source of fluid under pressure and with a first exhaust pipe including a flow-limiter and a first accumulator wherein said first accumulator is interposed between said control valve and said flow-limiter, the improvement characterized by a second exhaust pipe connected to said first exhaust pipe in parallel flow to said flow-limiter, said second pipe comprising a valve member constituted by a moving member of a second accumulator connected to a pipe supplying said brake operator means between said control valve and said brake operator means, said moving member being in a position to open the second pipe when the volume of said accumulator is minimal.

3,851,931

REVERSIBLE ENDLESS TRACK FOR VEHICLES

Angelo J. Crisafulli, Box 1051, Glendive, Mont. 59330

Filed Aug. 14, 1973, Ser. No. 388,208
Int. Cl. B62d *55/08*
U.S. Cl. 305—54 **9 Claims**



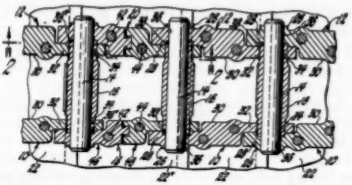
1. An endless track assembly for crawler type tractors of the type having supporting rollers and the like comprising a pair of substantially parallel links adapted to be pivotally connected to form an endless track chain, a track pad connected with each pair of links, and means removably connecting the track pads to the links to enable the links to be reversed and the endless track chain to be turned inside out, said means connecting the pad to the links including fastening means connected with the pad and connected with the links from either longitudinal edge of the links with equal facility whereby the links may be connected to the pads with either edge facing the supporting rollers for the track assembly, each link being provided with a longitudinally extending flange along each side thereof, said fastening means including bolts extending through each flange on each link and through the track pad, and spacer blocks disposed between the flanges and pads.

3,851,932

MASTER LINK FOR A CRAWLER TRACTOR

Thomas A. Story, Aurora, and Natabara Khuntia, Hudson, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed July 12, 1973, Ser. No. 378,790
Int. Cl. B62d *55/20*
U.S. Cl. 305—58 **1 Claim**



1. In a crawler tractor track; a master coupling link for detachably connecting the ends of said track comprising a pair of transversely spaced link members, a track shoe having a flat plate portion extending between said link members, each of said link members having two longitudinally extending separable sections each of which has an outer end portion defining a bore hingedly connected with an end of said track and an inner end portion, said inner end portion of one of said sections being formed with a dove-tail slot having a longitudinal center axis which is offset from the longitudinal center axis of the outer end portion formed with said one of said sections, the inner end portion of the other of said sections being formed with a dove-tail projection having a longitudinal center axis which is offset from the longitudinal center axis of the outer end portion formed with said other of said sections said dove-tail projection adapted to be located within said dove-tail slot to interlock said sections, the dove-tail slot and projec-

tion forming a juncture that is located in a plane perpendicular to the plane of the track shoe so as to prevent separation of the sections along the longitudinal axis of the link member and along an axis parallel to the axis of said bore, and a pair of cap screws extending through said track shoe into said two sections of each link member along a pair of axes that are parallel to and on opposite sides of said juncture and cooperating with the flat plate portion of said track shoe to prevent relative movement of said sections along the longitudinal axis of the dove-tail slot and projection, each of said cap screws extending into one of said two sections only.

3,851,933

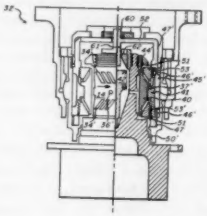
HYDRODYNAMIC FLUID-FILM BEARINGS

Peter E. Jacobson, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 12, 1972, Ser. No. 261,899

Int. Cl. F16c *35/00*

U.S. Cl. 308—9 **10 Claims**



1. A hydrodynamic journal bearing having a specified radial load capacity suitable for operation over a prescribed range of temperatures comprising

journal means including a selected material having a first coefficient of thermal expansion and a specific radial dimension,

sleeve means including at least two selected materials having second and third coefficients of thermal expansion, which are different from each other and each of which is different than the coefficient of thermal expansion of the journal means, and specific radial dimensions, said sleeve means being positioned relative to said journal means to provide a space therebetween, and

fluid means filling said space between said journal means and said sleeve means having a coefficient of viscosity which varies logarithmically with temperature and coacts with said selected materials having respective coefficients of thermal expansion whereby said space between said journal and said sleeve means varies as a linear function of temperature thereby providing a hydrodynamic bearing having a radial load capacity which remains substantially constant over said prescribed range of temperatures.

3,851,934

JOURNAL FOR ROLLS

Walter Kufner, Schweinfurt, Germany, assignor to SKF Industrial Trading and Development Company B.V., Amsterdam, Netherlands

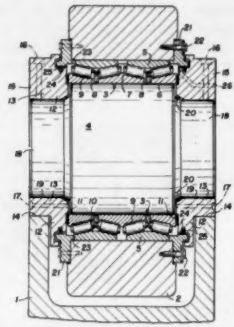
Filed Mar. 30, 1973, Ser. No. 346,583

Claims priority, application Germany, Apr. 21, 1972, 2219466

Int. Cl. F16c *13/00, 33/72*

U.S. Cl. 308—15 **8 Claims**

1. A journal for universal mill rolls and the like comprising a mill roll located in a supporting structure having opposed side walls, said mill roll being provided with a roller bearing and axle located within its bore and supported on the side walls, ring shaped cover members sealing each of the axial ends of said roller bearing, said ring shaped covers being formed integrally with a slide member having a rectangular shape when viewed in plan, said slide member being insertable



within a rectangular opening in the side wall of said supporting structure and having a pair of extending arms engaging the edge of said side wall and means for removably connecting said arms to said side wall.

3,851,935

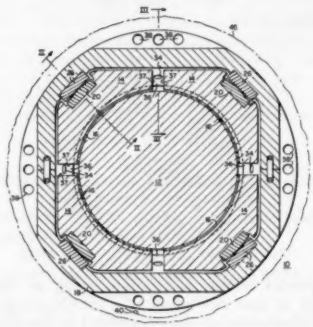
PIVOTED PAD BEARINGS

William F. Stahl, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 25, 1973, Ser. No. 364,160

Int. Cl. F16c *17/06*

U.S. Cl. 308—73 **3 Claims**



1. A tilting pad journal bearing comprising:

an array of four tiltable pad members which are annularly disposed so as to encircle a shaft, a stationary housing surrounding said tiltable pad members, means permitting radial and flexural movement to a shaft disposed inwardly of said pad members, said means comprising a plurality of key members disposed peripherally about said pads,

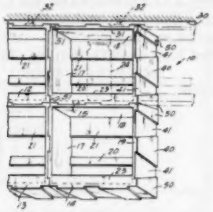
the radially outwardly disposed surfaces of said tiltable pad members defining a generally conical cross-sectional shape across both the transverse and longitudinal axes of each pad, said housing having a mating circumferentially disposed channel having a conically-shaped cross-section for receiving said tiltable pad members.

3,851,936

ATTACHMENT DEVICE FOR MODULAR UNITS

Richard Muller, Highland Park, Ill., assignor to Donat Talbot Archambult, Pools Park, Ill.

Filed Aug. 16, 1973, Ser. No. 388,986
Int. Cl. A47b *87/00, 87/02*
U.S. Cl. 312—108 2 Claims



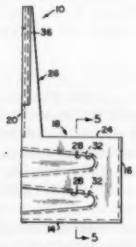
1. A modular unit assembly comprising a plurality of interfitting four-sided units with each side of each unit having alternating flutes and ribs extending continuously along the depth from a front to a back of the units, each rib having undercut side edges along the depth thereof, each rib increasing in width along the depth thereof at a wedge angle, and each flute decreasing in width along the depth thereof in complimentary relationship with the ribs, heights of the ribs and depths of the flutes being equal and the undercut edges of the ribs providing a dovetail interlock holding the ribs against the bottoms of the flutes and forming a continuous contact between outside surfaces of interfitting units and the mating wedge angles of the ribs and flutes locking the interfitting units in axially aligned relation.

3,851,937

MODULAR SPICE RACK

Emanuel A. Winston, 871 Marian Ave., Highland Park, Ill. 60035

Filed May 29, 1973, Ser. No. 364,810
Int. Cl. A47b *73/00, 87/02*
U.S. Cl. 312—111 3 Claims



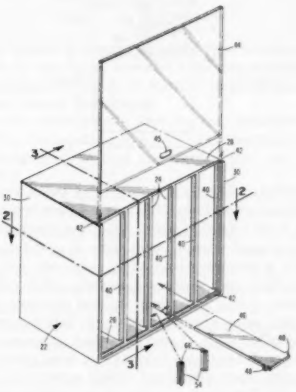
1. A modular rack device, said device comprising: compartment means comprising a bottom and a plurality of walls, said plurality of walls including a front wall attached to said bottom, a plurality of side walls attached to said bottom and front wall, said side walls having lower portions of substantially the same size as said front wall and substantially V-shaped upper portions extending above said lower portions, and a rear wall extending in corresponding relation to said side walls and attached to said bottom and side walls to define said compartment means having an open top and partially open front; and attachment means formed on two of said side walls, said attachment means comprising a plurality of substantially V-shaped grooves formed in said lower portion of one of said side walls and a plurality of substantially V-shaped tongues formed in said lower portion of another of said side walls, said attachment means further comprising a substantially V-shaped ledge formed on said side wall having said grooves formed thereon along the intersection of said upper portion with said rear wall and a substantially V-shaped slot correspondingly formed on said side wall having said tongues formed thereon, whereby a plurality of said devices may be attached to one another.

3,851,938

STORAGE DEVICE

Thomas R. McCowan, 430 Circle Eight Ln., Prescott, Ariz. 86301, and Thomas E. Ritter, Box 10, Kirkland, Ariz. 86332

Filed Sept. 24, 1973, Ser. No. 399,968
Int. Cl. A47f *3/00*
U.S. Cl. 312—117 7 Claims



1. A partitionable container for removably storing a plurality of articles in separate readily erectable compartments comprising a bottom wall, a rear wall, a top wall and opposite outer sidewalls including vertical slots formed in the opposing inner surfaces thereof, at least one vertically adjustable shelf including tabs projecting outward from the shelf sides into said vertical slots, first shelf support means for supporting said at least one shelf at a selected height, and second shelf support means for insertion into said vertical slots beneath said tabs and cooperating with said first shelf support means for supporting said shelf at said selected height.

3,851,939

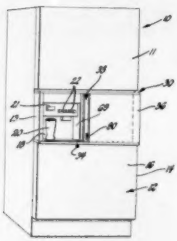
CABINET SLIDING PANEL AND TRACKING ARRANGEMENT

Louis Dean Benasutti, Fairborn, and Robert C. Reid, Springfield, both of Ohio, assignors to General Motors Corporation, Detriot, Mich.

Filed Nov. 5, 1973, Ser. No. 412,592
Int. Cl. A47f *3/00*
U.S. Cl. 312—138 R 3 Claims

1. In a refrigerator cabinet having an insulated door for closing a compartment therein, said insulated door having a recessed chamber in the outer shell thereof, a pair of vertically spaced horizontally extending top and bottom structural members extending between the side edges of said door so as to define the upper and lower extremities of said chamber, a fixed panel and a movable panel located in side-by-side relation between said structural members such that said panels have their opposed inner edges spaced apart a defined distance, said movable panel normally closing said chamber, means for mounting said movable panel for horizontal sliding

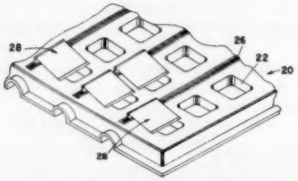
movement between its chamber closed position and an open position in which it underlies said fixed panel, said mounting means comprising first and second pairs of mirror image track grooves in each of said structural members, said movable panel including an integral inwardly offset flange formed along its inner edge and coextensive therewith so as to underlie said fixed panel inner edge whereby said offset flange bridges the space between said fixed and movable panels, said movable panel having outer follower means carried by the upper and lower edges thereof for movement in said second track grooves, said offset flange having inner follower means carried by the upper and lower edges thereof for movement in said first track grooves, said first track grooves having outwardly offset ends adjacent said fixed panel inner edge for receiving said offset flange follower means when said movable panel is in its closed position, said first track grooves positioned in spaced relation rearwardly of said fixed panel and pitched at a predetermined angle outwardly and rearwardly from said first track grooves outwardly offset ends, whereby upon initial sliding movement of said movable panel to its service area open position said inner follower means move from said offset ends of said first track grooves causing said movable panel inner edge to clear said fixed panel inner edge, and whereby upon continued sliding movement the pitched angle of said first track grooves allows said movable panel to clear said fixed panel inner edge and slide in an uninterrupted manner to its open position behind said fixed panel.



3,851,940
TRANSPORT APPARATUS FOR UNIT DOSE CONTAINERS OF PHARMACEUTICAL MATERIALS

Kenneth D. Relyea, Grove City, Ohio, and John A. Santangelo, Metuchen, N.J., assignors to Drustar Unit Dose Systems, Inc., Grove City, Ohio

Filed Aug. 13, 1973, Ser. No. 387,905
Int. Cl. A47b *67/00*
U.S. Cl. 312—234.5 **4 Claims**

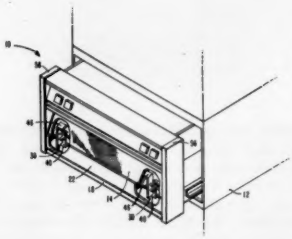


1. An improved transport apparatus for the delivery and dispensing of unit dose pharmaceutical materials comprising, in combination, a tray means provided with a plurality of recesses spaced from another, each of said recesses being adapted to removably receive an individual pharmaceutical container, said tray means including means defining a slot disposed adjacent to each of said recesses; the improvement comprising container retaining means comprising an integrally formed flexible sheet of plastic material removably disposed in said slot means and including a resilient flange portion extending over an adjacent container receiving recess in resilient force transmitting engagement with an individual container disposed in said recess, said flange portion including patient and pharmaceutical identifying indicia.

3,851,941
CONCEALED ENCLOSURE LATCH

Robert F. Stebe, Thousand Oaks, Calif., assignor to VRC California Inc., Los Angeles, Calif.

Filed May 4, 1973, Ser. No. 357,178
Int. Cl. A47b *88/00*
U.S. Cl. 312—333 **7 Claims**



1. In an electronic equipment enclosure having at least one chamber in which circuit components reside, the combination therewith of:

latch means disposed within the enclosure;

panel means mounted on the enclosure; and

door means mounted on the enclosure and movable between a first position which encloses the chamber and a second position which opens the chamber and permits removal of the circuit components therein;

said latch means extending between a support member in the enclosure and the door means and being engageable with the door means to maintain the door means in the first position and disengageable from the door means when manually actuated to permit movement of the door means into the second position, the panel means at least partially removably concealing the latch means from view while providing access to the latch means for manual actuation thereof when the panel means is at least partially removed.

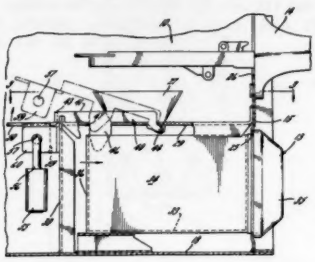
3,851,942
METER BOX WITH VAULT LATCH

Howard W. Clay, and Donald E. Schmitt, both of Rockford, Ill., assignors to Reed Industries, Inc., Rockford, Ill.

Filed Dec. 3, 1973, Ser. No. 420,945
Int. Cl. A47b *88/22;* **E05c** *3/00*
U.S. Cl. 312—333 **8 Claims**

1. Apparatus for use with a coin-operated machine and comprising a box having upright side walls and an upright front wall, an opening formed through said front wall, a cash drawer having upright front and rear walls, said drawer normally being in a closed position within said box but being removable from said box through said opening, a key-operated locking mechanism mounted on one of said front walls and engageable with the other of said front walls to lock said drawer within said box, an access opening formed through one of the side walls of said box, a door normally covering said access opening and normally locked to said one side wall, and a support attached to at least one of the walls of said box, the improvement in said apparatus comprising, a latch mounted on said support and biased to a latched position, said latch having a first surface which, when said latch is in said latched position and said drawer is in said closed position, engages the rear wall of the drawer to hold the drawer in

its closed position, said latch being accessible through said access opening when the latter is uncovered and being manually movable to an unlatched position releasing the rear wall of said drawer, and said latch having a second surface positioned to engage the rear wall of said drawer as the latter is



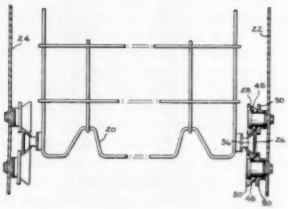
moved rearwardly toward said closed position and operable as an incident to such engagement to cause camming of said latch to said unlatched position to enable movement of said drawer into said closed position whereupon the latch automatically returns to said latched position.

3,851,943

RACK SUPPORT ASSEMBLY IN A DISHWASHER

Matthew K. Afful, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 29, 1972, Ser. No. 319,349
Int. Cl. A47b *88/04*
U.S. Cl. 312—347 **5 Claims**



1. A dishwashing machine of the front-loading type having a wash chamber and an access opening thereto, a rack for supporting dishes to be washed slidably mounted in the chamber for movement between a loading position wherein the rack extends at least partially out through the access opening and a retracted position wherein the rack is fully within the chamber,

support means at each side of the rack including an elongated channel slide member having a substantially flat major body portion and upper and lower projecting flange portions converging toward each other whereby a load bearing surface is provided on the lower flange portion immediate said major body portion, said channel slide member further being disposed to extend generally in a horizontal orientation along the chamber side wall and slidably mounted for forward-rearward reciprocal movement in the direction of its extension,

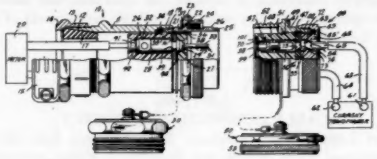
the load bearing surface being inclined relative to the major body portion whereby a center point taken on the load bearing surface is on a line forming an acute angle with the generally vertical surface of the major body portion of the channel slide member whereby the load resultant of rack load on the lower flange portion is oriented substantially near the shear center of the channel slide member.

3,851,944

CURRENT TRANSFORMER CONNECTOR

Albert E. Ganzert, Elmwood; Bronius Gaizauskas; Leonard Andrychowski, both of Chicago, and Nabil Mina, Northlake, all of Ill., assignors to Okzona Incorporated, Asheville, N.C.

Filed Mar. 30, 1973, Ser. No. 346,690
Int. Cl. H01r *31/08*
U.S. Cl. 339—19 **9 Claims**



1. In an electrical connector of the type wherein an electrical circuit is continued over at least two conductor paths through engaged contacts of mated connector parts, the improvement therein comprising:

means for automatically shorting the conductor paths by shorting the contacts of one of said connector parts upon disengagement of said connector parts, said means including

an electrically conductive element mounted in said one connector part adjacent each of the contacts thereof; an electrically conductive shorting actuator movably mounted in each of said contacts of said one connector part and moved away from said conductive element by the corresponding contact of the other connector part upon mating of the connector parts; and

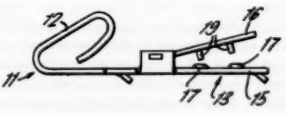
bias means for each of said actuators mounted to urge said actuators into electrical contact with said conductive element upon disengagement of the connector parts, each of said contacts of said one connector part including a hollow portion and each of said actuators including a first portion slidably mounted within and electrically contacting said hollow portion of a respective contact and a second portion having a bore for receiving and releasably engaging the corresponding contact of the other connector part and said bias means including a spring retainer carried on each said actuator and a respective bias spring mounted between said spring retainer and the part which includes the hollow portion of the respective contact.

3,851,945

ELECTRICAL CONNECTOR FOR FLEXIBLE FLAT CABLE

John Covell Collier, Farnworth, England, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 20, 1973, Ser. No. 417,664
Claims priority, application Great Britain, Nov. 29, 1972, 55027/72
Int. Cl. H01r *11/20*
U.S. Cl. 339—97 C **3 Claims**



1. An electrical contact made from sheet material having a part for connection to a flat conductor of a flat, flexible cable,

the part comprising first and second arms arranged in spaced, opposed relationship, the arms being relatively movable towards each other for crimp connection to a flat conductor of the cable, the first arm having an embossment in the form of a dome, the apex of the dome having a through aperture, the second arm having a lance extending towards and in alignment with the aperture so that on crimping, the lance initially pierces the cable and passes through the aperture, subsequent crimping pressure causing the embossment to flatten with a consequent reduction in area of the aperture, the sides of which aperture grip the lance and inhibit withdrawal of the lance from the aperture.

3,851,946

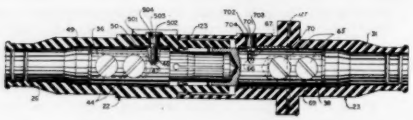
CABLE CONNECTING ASSEMBLY

Robert Edgar Piaget, deceased, 2136 Madison Rd., late of Cincinnati, Ohio 45208, and Dorothy R. Piaget, executrix, 4432 Homer Ave., Cincinnati, Ohio 45227

Continuation of Ser. No. 195,975, Nov. 5, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,270

Int. Cl. H01r *13/18*

U.S. Cl. 339—259 R **12 Claims**



1. In a cable connecting assembly, the combination of a male connector member including a body and a connector head including an outer portion, a frusto-conic intermediate section, and an inner section, the inner section and the intermediate section meeting at a circular contact line, with a female connector member including a body and an annular, open ended connector end portion having a substantially cylindrical socket therein for receiving the connector head of the male member, there being lengthwise slots in the connector end portion of the female member extending from the open end and dividing the end portion of the female member into a plurality of spring teeth, the normal diameter of the socket of the female member being less than the diameter of the contact line and substantially equal to the diameter of the outer portion of the connector head so that the teeth of the female member are engageable with the head of the male member at the contact line to resiliently engage the head of the male member while the outer portion of the head of the male member aligningly cooperates with a portion of said female member spaced from said contact line.

3,851,947

REFLEX REFLECTOR

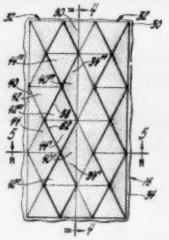
James R. Montgomery, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 24, 1973, Ser. No. 400,241

Int. Cl. G02b *5/12*

U.S. Cl. 350—103 **1 Claim**

1. A reflex reflector comprising: an array of interfitting V-block shaped cube corners having three mutually perpendicular reflecting faces within a frontal rectangular boundary and intersecting at an apex, each of said cube corners including a first base bounded by a short side and the diagonals from the ends thereof to the apex, a second face bounded by a long side and the diagonals from the ends thereof to the apex including the diagonal common with the first face, and a third face bounded by the opposite short side and the diagonals from the ends thereof to the apex including the diagonal common with the second face, the individual faces mating in the array with



the corresponding faces of juxtaposed adjacent cube corners to form a rectangular reflex strip.

3,851,948

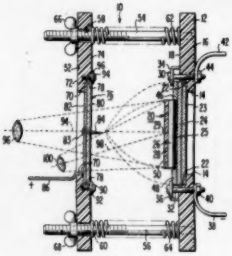
HOLOGRAPHIC THERMOPLASTIC MEMORY SYSTEM

Robert Allen Gange, Belle Mead; Eugene Michael Nagle, Middletown, and Carl Charles Steinmetz, Mercerville, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 3, 1973, Ser. No. 385,305

Int. Cl. G02b *27/00*

U.S. Cl. 350—3.5 **6 Claims**



1. A holographic memory system, comprising

a multi-layer holographic storage device including a transparent thermoplastic recording medium having a large area for the storage of a large number of individual holograms, a photoconductive layer, and at least one layer providing light absorption, electrical conductivity and physical support,

means to heat the entire area of said thermoplastic storage medium to a temperature just below the temperature at which said medium becomes plastic,

means to place a uniform electric charge on said thermoplastic recording medium, and

means to direct an object beam and a reference beam forming an individual hologram to and through a single selected small area of said storage medium and said photoconductor, whereby an electrically conductive pattern is formed in said photoconductive layer which results in a corresponding charge pattern thereon, said object beam and reference beam continuing on to said light absorption layer, whereby heat generated in said light absorption layer causes solely said small area of said recording medium to become plastic, so that it can assume a physical pattern determined by said charge pattern.

3,851,949

MICROSCOPE HAVING A PHOTOMETER

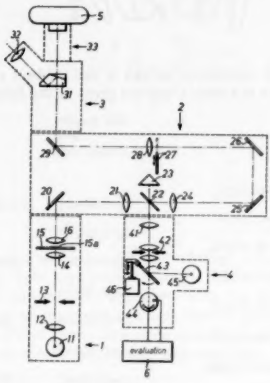
Winfried Kraft, Werdorf; Heiko Wasmund, Asslar, and Karl-Heinz Haas, Wetzler, all of Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Continuation of Ser. No. 153,691, June 16, 1971. This application Jan. 8, 1973, Ser. No. 321,949

Claims priority, application Germany, June 18, 1970, 2029850; Apr. 10, 1971, 2117535

Int. Cl. G02b *21/18*

U.S. Cl. 350—18 9 Claims



1. A microscope apparatus without an additional, separately disposed viewing telescope comprising:

a. first optical means defining a main optical path for microscopic examination of an object positioned on a stage, said first optical means comprising in a first subassembly an illuminator with a field lens and a radiant field stop, a condenser, and an objective positioned in a first housing; in a second subassembly, mirrors, optical lenses, and a movable light blocking stop, defining a folded portion of the main optical path and positioned in a laterally extending intermediate tube coupled to said first housing;

b. second optical means for dividing said main optical path into an observation path and a measurement path, one of which is angularly displaced from said main path, said second optical means comprising a beam splitter and a triple mirror positioned in said intermediate tube;

c. third optical means defining a restrictive aperture the area of which may be varied, said third optical means comprising a measuring slit, said aperture being located in said measurement path between a folding mirror and a lens, said beam splitting means causing an image of said aperture to be formed in said observation path;

d. fourth optical means for ocular observation comprising an ocular positioned in an ocular tube coupled to said intermediate tube for simultaneously observing the images of said object and of said aperture, said image of said aperture positioned to indicate that portion of said object from which the illumination will be measured;

e. fifth optical means for illuminating said aperture to permit observation thereof, said optical means comprising a light source and said folding mirror;

f. sixth optical means positioned in said measurement path to photometrically receive and measure the intensity of light from said main optical path after passage of said light through said lens and said measuring slit and impingement on a photomultiplier; and

g. said triple mirror positioned in said measurement path and located after said beam splitter in said intermediate tube for reflecting the image of said aperture into said observation path.

3,851,950

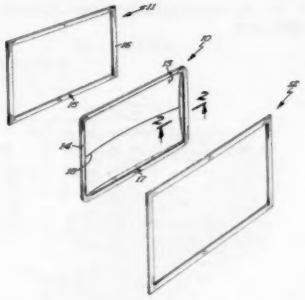
PROJECTION SCREEN

William A. Andres, Hopkins; Larry D. Quanrud, Minneapolis; Charles J. Koppa, Wayzata; Larry F. Becker; William K. Christoffersen, both of Minneapolis, and James L. Keely, Wayzata, all of Minn., assignors to Washington Scientific Industries, Inc., Long Lake, Minn.

Filed June 18, 1973, Ser. No. 370,950

Int. Cl. G03b *21/56*

U.S. Cl. 350—125 17 Claims



1. A front projection screen assembly which comprises:

an aluminum or aluminum alloy member having a reflecting surface provided with random non-directional surface irregularities formed by the etching of a smooth, bright surface which is free of surface defects; and

means for supporting said aluminum member including pivot means engaging said aluminum member for preventing a translation of said aluminum member with respect to said supporting means in at least one direction while allowing said aluminum member to pivot with respect to said supporting means about said pivot means.

3,851,951

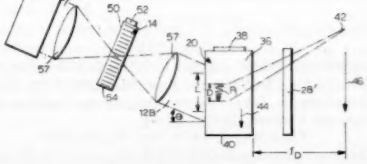
HIGH RESOLUTION LASER BEAM RECORDER WITH SELF-FOCUSING ACOUSTO-OPTIC SCANNER

Jason H. Eveleth, Mountain Lakes, N.J., assignor to Isomet Corporation, Oakland, N.J.

Filed Jan. 16, 1974, Ser. No. 433,699

Int. Cl. G02f *1/28*

U.S. Cl. 350—161 16 Claims



1. An optical scanner system comprising an acousto-optic diffraction cell, means for introducing acoustic pulses to said cell for travel along the cell, each pulse having a band of acoustic frequencies which vary between the leading end of the pulse and the trailing end of the pulse, means for applying a beam of light to said cell at an angle for diffraction from each pulse, whereby light is focused by diffraction from each pulse to a spot in an image plane, and means providing an image aperture at said image plane across which each spot is scanned in accordance with the movement of the corresponding pulse along said cell, the dimension of said image aperture

along the scanning direction of each spot being very large compared to the corresponding dimension of the spot.

3,851,952
MACRO-ZOOM LENS SYSTEM

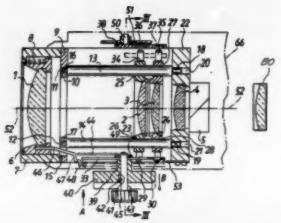
Siegfried Werz, Munich, and Johann Zanner, Jr., Unterhaching, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 7, 1973, Ser. No. 358,095

Claims priority, application Germany, May 6, 1972, 2222411

Int. Cl. G02b *15/00*

U.S. Cl. 350—187 **3 Claims**



1. A macro-zoom lens system comprising a fixed base objective and an adjustable portion having four optical elements; focusing means for adjusting the position of a first one of said four optical elements; focal length adjusting means for adjusting the position of a second and third of said optical elements relative to each other and to the fourth of said optical elements which is stationarily arranged, said focal length adjusting means comprising two control discs, one constituting a macro-adjusting means engageable with said second and said third optical element for adjusting the position of said second and said third element in fixed relationship to each other relative to said fourth element from a telephoto position to a close-up range position, said discs being turnable about a common axis, one of said discs being provided with a pair of cam tracks for close-up photography and the other with a pair of varifocal cam tracks, shiftable means including link means connecting said discs movable together in the direction of said axis between two end positions, in one of which said second and said third optical element are connected to the cam tracks of one of said discs while in the other of said end positions said second and said third optical element are connected to the cam track of the other of said discs, and means for coupling said discs for simultaneous rotation about said axis.

3,851,953
PHOTOGRAPHIC LENS SYSTEM HAVING SHORT OVERALL LENGTH AND LARGE APERTURE RATIO

Jihei Nakagawa, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

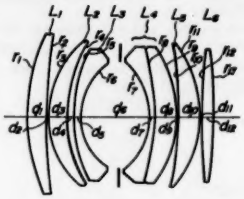
Filed May 2, 1973, Ser. No. 356,599

Claims priority, application Japan, May 4, 1972, 47-44325

Int. Cl. G02b *9/62*

U.S. Cl. 350—215 **1 Claim**

1. A photographic lens system having a short overall length and a large aperture ratio, which is constructed as six components and seven lenses and consists of a first component of a positive meniscus lens that has its object side a convex surface, a second component of a positive meniscus lens that has its object side a convex surface, a third component of a negative meniscus lens that has its object side a convex surface, a fourth component of a negative meniscus doublet that has its image side a convex surface, a fifth component of a positive meniscus lens that has its image side a convex surface, and a sixth component of a positive lens, and in which radii of curvature of the lens surfaces r, air spaces and axial thicknesses of



the lenses d, refractive indices n and Abbe's numbers, all counted from the object side are given in the following table:

Lens	Radii r	Air spaces and thicknesses	n	ν
			1	
L_1	r_1=0.78185	d_1=0.08861	1.8348	42.8
	r_2=2.59845	d_2=0.00232	1	
L_2	r_3=0.42498	d_3=0.08784	1.8061	40.8
	r_4=0.60180	d_4=0.03436	1	
L_3	r_5=0.69415	d_5=0.02606	1.7847	26.22
	r_6=0.28654	d_6=0.30888	1	
	r_7=−0.31581	d_7=0.02645	1.7847	25.7
L_4	r_8=−0.99807	d_8=0.09981	1.8061	40.8
	r_9=−0.52703	d_9=**0.00193**	1	
L_5	r_{10}=−1.50994	d_{10}=0.09691	1.713	54.0
	r_{11}=−0.50290	d_{11}=0.00232	1	
L_6	r_{12}=3.38224	d_{12}=0.05174	1.713	54.0
	r_{13}=−1.86805		1	

Overall focal length f=1.0
Backfocal length f_B=0.741 and
Overall length L=0.82723

3,851,954
OPHTHALMOSCOPIC CAMERA

Naoomi Kato, Yokohama, and Morio Tao, Kamakura, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 18, 1972, Ser. No. 315,841

Claims priority, application Japan, Dec. 25, 1971, 46-2147

Int. Cl. A61b *3/14*

U.S. Cl. 351—7 **4 Claims**

1. An ophthalmoscopic camera comprising:

a photographic optical system including an objective lens for forming an image of the fundus of an eye;

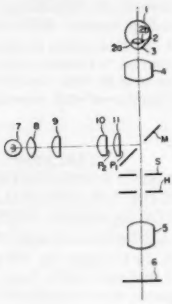
an illuminating optical system for illuminating the fundus of the eye including a light source, first and second condenser lenses;

a mirror disposed at the intersection between the two optical axes of said photographic and illuminating optical systems for directing the light rays emanating from the light source into said fundus of the eye through said objective lens;

said mirror having an aperture for passing therethrough the image-forming light rays reflected from the fundus of the eye;

a ring-shaped aperture provided in said illuminating optical system and substantially conjugate with a cornea of the eye with respect to said objective lens for preventing the light rays reflected by the corneal surface from entering into the path of said image-forming rays;

a center obscuring stop provided in said illuminating optical system and substantially conjugate with the median point between the front and rear surfaces of a crystalline lens of the eye with the respect to said objective lens for preventing the light rays reflected by the front and rear surfaces of the crystalline lens from entering into the path of the image-forming light rays; and



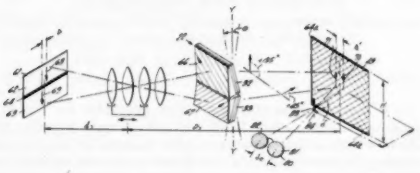
an aperture stop for passing therethrough only said image-forming light rays passed through said aperture of said mirror, substantially conjugate with the median point between an image of said ring-shaped aperture and an image of said center obscuring stop formed by the objective lens with respect to said objective lens.

3,851,955

APPARATUS FOR CONVERTING MOTION PICTURE PROJECTORS FOR STEREO DISPLAY

Arthur P. Kent, Kew Gardens, and Mortimer Marks, Beechhurst, both of N.Y., assignors to Marks Polarized Corporation, Whitestone, N.Y.

Filed Feb. 5, 1973, Ser. No. 329,733
Int. Cl. G03b *35/08*
U.S. Cl. 352—60 **8 Claims**



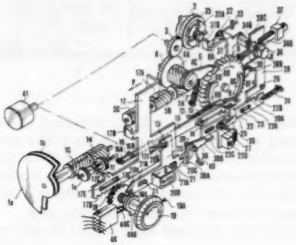
1. Apparatus for producing stereo motion picture displays comprising in combination with a single film motion picture projector, a projection lens for said projector, a single film strip having a series of image frames with a pair of corresponding stereo images in each frame, an opaque band extending across the center of each frame for separating the images of the stereo pair along their abutting margins, said opaque hand having a width of 10 to 12 percent of the image frame, a hollow housing, means to secure one end of the housing to the projection lens, a prism assembly carried by the opposite end of the housing, said prism assembly comprising a first and a second angularly adjustable prism, said first and second prisms abutting each other at their inner edges, a light polarizer laminated to each of said prisms, the plane of polarization of the polarizer of the first prism being disposed normal to the plane of polarization of the polarizer of the second prism, said prism abutment being parallel to and in optical alignment with but spaced from the opaque band between the stereo pairs when they are being projected, said prisms each receiving one of the images of the stereo pair in each of the image frames and directing them in overlapped relationship together with the opaque band upon a screen with the plane of polarization of the two images of a stero pair being normal to each other and the opaque band at opposite edges of the screen.

3,851,956

PHOTOGRAPHIC OVERLAPPING APPARATUS HAVING SAFETY DEVICES FOR MOTION PICTURE CAMERAS

Yoshio Komine, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Shimomaruko, Ohta-ku, Tokyo, Japan

Filed Sept. 11, 1973, Ser. No. 396,300
Claims priority, application Japan, Sept. 14, 1972, 47-92337
Int. Cl. G03b *21/36*
U.S. Cl. 352—91 C **14 Claims**



1. An overlapping photographing device for a motion picture camera comprising;
- a shutter having a variable-exposure aperture,
- means for driving said shutter,
- means operatively coupled to said driving means for varying said shutter aperture in a fade-out sequence and in a fade-in sequence,
- means for alternatively transporting a film in a forward or a reverse direction in accordance with said fade-out sequence and in a film reversing sequence of said overlapping photographing,
- switching means for operating said film transporting means to establish it in one of a forward transport state and a reverse transport state,
- overlapping photography control means selectively operable in synchronization with said shutter driving means for automatically controlling the operation of said shutter aperture varying means and said switching means at selected times, said control means being arranged not returnable to an original rest position thereof when once operated, and
- a safety mechanism arranged in interlocking relationship with said control means, said mechanism having a manually operable member which when actuated terminates the operation of said control means at any time during the operation thereof.

3,851,957

AUTOMATIC SOUND FILM PROJECTOR-PLAYER

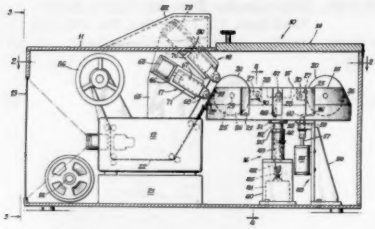
Ray C. Anderson, 6655 S. New Haven, Tulsa, Okla. 74136

Filed Mar. 23, 1972, Ser. No. 237,253
Int. Cl. G03b *1/56, 23/02*
U.S. Cl. 352—123 **6 Claims**

1. An automatic sound film cartridge projector apparatus comprising:
- a housing having a plurality of side walls;
- a self-threading sound film projector disposed within said housing;
- screen projection means supported on one of said side walls for viewing the pictures reproduced by said projector;

selectively positionable film cartridge magazine means for retaining a plurality of film cartridges operatively associated with said projector, said magazine means comprising a rotatable drum formed with a plurality of radial cartridge retention slots, said drum being mounted to rotate in a horizontal plane adjacent to said projector;

first electrically actuated drive means for feeding the film from a selected cartridge in said magazine means to said



projector, said first electrically actuated drive means comprising an electric motor carrying a film drive wheel and a solenoid operatively associated with said motor and operable when actuated to move said drive wheel towards said drum into contact and with the film for feeding the film along the drum into said projector; and

second electrically actuated drive means for rewinding the film into the cartridge upon completion of play by said projector.

3,851,958

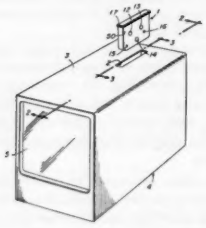
PHOTOGRAPHIC SYSTEM FOR PROCESSING AND PROJECTING TRANSPARENCIES

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 227,080, Feb. 17, 1972, abandoned. This application July 31, 1973, Ser. No. 384,382

Int. Cl. G03c *11/00*

U.S. Cl. 352—130 **45 Claims**



1. Apparatus for use with a motion picture film handling cassette to effect film processing and projection operations including a substantially opaque housing, a strip of exposed unprocessed motion picture film, a normally inoperative processing station for treating an incremental section of such film strip to develop viewable images thereon, a projection station including access means for permitting illumination from an externally mounted source to be directed through an incremental section of such film strip, and means responsive to externally mounted actuating means for progressively advancing such film strip through such processing station and such projection station, said apparatus comprising:

means for receiving such cassette in an operative position;

means for selectively precluding light rays from reaching such access means;

a normally inoperative source of illumination positioned to be in cooperative relationship with such access means when such cassette is positioned in said receiving means;

means for selectively energizing said source of illumination;

first means for selectively actuating such cassette film strip advancing means and for rendering such processing station operative; and

means for automatically sequencing the operation of said light precluding means, said illumination energizing means, and said first means in accordance with a predetermined program to facilitate first the treatment of such exposed film strip to form viewable images thereon and then the projection of such viewable images.

3,851,959

METHOD AND DEVICE FOR CONTROLLING A MOTION PICTURE PROJECTOR, ESPECIALLY A PROJECTOR FOR TEACHING MACHINES

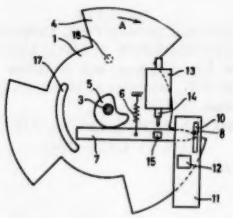
Gerhard Kreutze, 2 Beethovenstrasse, 6901 Bammental; Manfred Moessner, 14 Hebelstrasse, 6991 Eppelhem; Guenther Obstfelder, 26 Im Enkler, 6906 Neim; Gerhard Soehring, 26 Untere Burggarten, 6901 Dossenheim, and Victor Pfirrman, 46 Leuschnerstrasse, 6700 Ludwigshafen, all of Germany

Filed Mar. 15, 1973, Ser. No. 341,327

Claims priority, application Germany, Mar. 16, 1972, 2212176

Int. Cl. G03b *1/00*

U.S. Cl. 352—177 **6 Claims**



1. A method of controlling a film projector for use in a teaching machine, which further includes a tape recorder, the tape of which having signals recorded thereon for initiation or stopping the movement of a film in said projector, on said film there being provided with designations associated with the frames of said film, said designations being formed as optical marks which indicate each frame whether being a frame of a motion picture scene or being a frame for still picture presentation only; said projector including a cam which rotates together with a sectored shutter and actuates a claw for moving the film, and an additional actuating element by means of which the claw is prevented from engaging the film for movement or is released for film transport, the operation of said actuating element being controlled by signals derived from the rotation of the sectored shutter and from the movement of the film wherein the first of said signals (a) being produced by means of an illuminated slot in the sectored shutter and at least one photoelectric component located in the circular path in which the slot moves as the sectored shutter rotates and the second of said signals (b) being produced by means of said optical marks on the film and at least one further photoelectric component associated therewith, when an initial or stop signal from the tape recorder is fed to the projector the occurring of said signals (a) and (b) being detected and only when said signals (a) and (b) coincide a control signal activates to initiate or stop film movement.

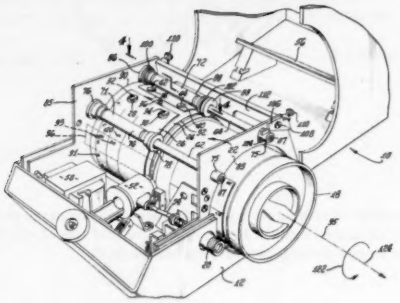
3,851,960
ULTRAMICROFICHE VIEWER HAVING AXIALLY MOVABLE AND ROTATABLE DRUM

Herbert Brooks, La Verne; John D. Gearheart, Covina, and John L. Jones, Gardena, all of Calif., assignors to UMF Systems Incorporated, Los Angeles, Calif.

Continuation-in-part of Ser. No. 225,712, May 22, 1972, Pat. No. 3,799,663. This application July 26, 1973, Ser. No. 382,956

Int. Cl. G03b *21/11, 23/10*

U.S. Cl. 353—27 **14 Claims**



1. A mounting system for an information carrying drum comprising in combination:

a housing;

a plurality of rollers mounted to said housing so as to be rotatable and translatable relative to said housing; and

a drum supported by said rollers having a handle extending beyond said housing whereby appropriate movement of said handle causes rotation and/or translation of said drum.

3,851,961
LIGHT PROJECTION APPARATUS

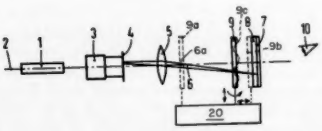
Gerhard Winzer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Apr. 3, 1972, Ser. No. 240,660

Claims priority, application Germany, Apr. 28, 1971, 2120939

Int. Cl. G03b *21/14*

U.S. Cl. 353—38 **10 Claims**



1. An apparatus for selectively projecting an undistorted and distorted image having interference lines on a screen comprising a screen, at least one source of coherent light for projecting a beam of coherent light onto the screen, a film means disposed in the beam of light to impose an image thereto, lens means for focusing the beam of light containing the imposed image onto the screen, and means arranged between the lens means and screen for selectively diffracting the beam of coherent light to selectively create on the screen a distorted image having lines and contours exhibiting interference lines.

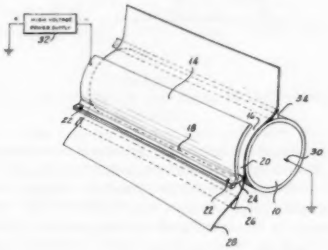
3,851,962
ELECTROSTATIC HOLD DOWN APPARATUS

Curtis P. Van Vloten, Acorn Park, Mass., assignor to Savin Business Machines Corporation, Valhalla, N.Y.

Filed Aug. 29, 1973, Ser. No. 392,746

Int. Cl. G03g *15/16*

U.S. Cl. 355—3 R **4 Claims**



1. In a copier having a conductive support the surface of which carries photoconductive material adapted to receive an electrostatic image which is developed with tacky toner and which is to be transferred to a sheet of copy material fed to said surface at a transfer station, apparatus for electrostatically holding said sheet of copy material in contact with said surface at said transfer station including a plate-like electrode of conductive material, means mounting said electrode at said transfer station in closely spaced relationship to said surface to form a passage having an entrance into which said sheet is introduced and an exit from which said sheet emerges in the course of a transfer operation, a source of potential, means for applying said potential to said electrode to produce a static electrical field in said passage, and means for applying said potential directly to said sheet as it moves into said entrance.

3,851,963

Patent Not Issued For This Number

3,851,964

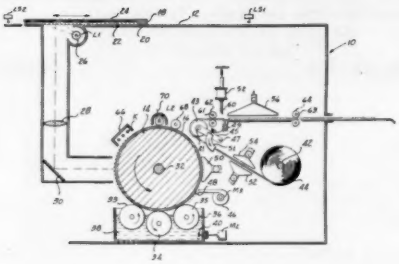
CONTACT TRANSFER ELECTROSTATIC COPYING APPARATUS

Ian Edward Smith, Lockleys; Peter John Hastwell, Elizabeth Grove, and Marinus Cornelus Vermeulen, Valley View, all of Australia, assignors to Savin Business Machines Corporation, Valhalla, N.Y.

Division of Ser. No. 155,108, June 21, 1971,. This application May 14, 1973, Ser. No. 359,651

Int. Cl. G03g *15/14, 15/10*

U.S. Cl. 355—10 **7 Claims**



1. In an electrophotographic apparatus a conductive carrier, a photoconductive surface supported by said carrier, means for charging said photoconductive surface, means for exposing said charged surface to a pattern of light and shade of an image to be reproduced to form a latent electrostatic image, a tank for holding liquid toner, means for subjecting said latent electrostatic image to the action of said liquid toner to form a tacky image, transfer means for bringing sheet material into contact with the tacky image while on said photoconductive surface to transfer the developed image thereto, and means for heating said sheet material before said sheet material arrives at the contacting means.

3,851,965

CLEANING APPARATUS FOR ELECTROCOPYING MACHINES

Masayoshi Furuichi, Tokyo; Nobuo Akiba, Kawasaki, and Seiichi Kudo, Tokyo, all of Japan, assignors to Katsuragawa Denki Kabushiki Kaisha, Yaguchi, Ota-ku, Tokyo-to, Japan

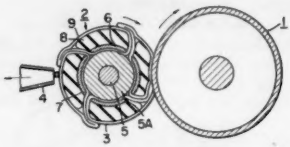
Filed May 3, 1973, Ser. No. 357,073

Claims priority, application Japan, May 8, 1972, 47-053571

Int. Cl. G03g *15/00*

U.S. Cl. 355—15 **8 Claims**

1. Cleaning apparatus for cleaning residual toner from an image forming surface of an electrocopying machine comprising a cylindrical body made up of a plurality of resilient circumferentially adjacent segments, a fabric cover over the outer periphery of said cylindrical body, said fabric cover having a peripheral length longer than that of said cylindrical body, means for securing portions of said fabric cover between said adjacent segments so that portions of said fabric cover are folded back on the surface of said cylindrical body, an air suction nozzle oriented generally in the radial direction of said cylindrical body and having a suction port adjacent thereto, and a spacer rod located between said suction port and said cylindrical body, whereby, in use, said folded back



portions of said fabric cover are blown away from the periphery of said cylindrical body and toward said spacer rod by an air stream flowing into said air suction port.

3,851,966

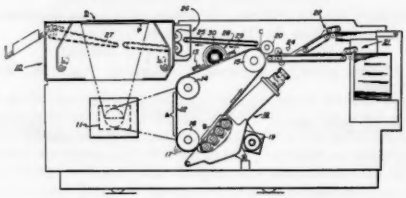
REPRODUCTION APPARATUS

Edward G. Reehil, Henrietta, and Edward L. Steiner, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 11, 1972, Ser. No. 314,218

Int. Cl. G03g *15/16, 15/00*

U.S. Cl. 355—17 **6 Claims**



1. In a reproduction machine adapted for making copies of an original through a plurality of process steps including exposure of the original to form a latent electrostatic image of the original on a photoconductive surface, developing the image to provide a toner image of the original on the photoconductive surface, providing an electrical bias on the copy paper and holding the copy paper against the toner image by means of an electrically biased transfer roller to transfer the toner image to the copy paper, a method to minimize toner consumption and toner contamination of the machine comprising the steps of:

continuously energizing the transfer roller and maintaining the transfer roller in contact with the photoconductive surface during a normal copy run;

removing the electrical bias on the transfer roller moving the transfer roller away from the photoconductive surface in the event of a paper misfeed to prevent transfer of toner to the roller; and,

de-energizing the developer to prevent development of latent electrostatic images passing by the developer subsequent to a paper misfeed.

3,851,967

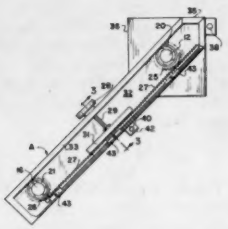
EASEL ILLUMINATION MONITORING METHOD

Randolph D. Rubin, 301 W. Ohio, Midland, Tex. 79701

Division of Ser. No. 315,357, Dec. 15, 1972, Pat. No. 3,807,857. This application Mar. 7, 1974, Ser. No. 448,852

Int. Cl. G03b *27/76*

U.S. Cl. 355—77 **8 Claims**



1. Method of controlling the relative exposure light intensity while making different sizes of photographic prints with a projection printing apparatus comprising the steps of:

1. mounting a projection printing apparatus having a primary diaphragm and lens therein in spaced relation respective to an easel;
2. passing light from a light source, through a negative, through the primary diaphragm and lens, and onto printing paper supported by the easel;
3. passing a sample of light from said light source, through a secondary diaphragm and lens, and onto a light sensor apparatus;
4. spacing said light sensor and said secondary lens a distance apart which is proportional to the spacing between said easel and said primary lens;
5. concurrently and proportionally adjusting both diaphragms to thereby select the optimum light intensity for making a first size print;
6. measuring the intensity of the light which passes into the light sensor apparatus;
7. making a second size print by changing the magnification and concurrently and proportionally adjusting both diaphragms to cause the light sensor to receive the same light intensity measured in step (6).

3,851,968

METHOD FOR PHOTOGRAPHING A SET OF VARYING CONTRAST RADIOGRAPHIC X-RAYS

Stanley A. Hoffman, Hedard Hill Rd., R.D. No. 2, Randolph, Vt. 05060, and David J. Paxton, 70 Park Rd., Wyomissing Hills, Reading, Pa. 19609

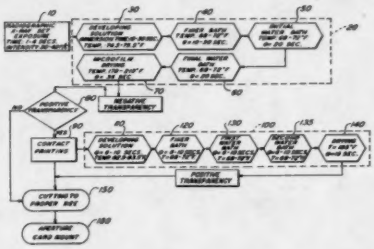
Continuation-in-part of Ser. No. 129,453, March 30, 1971. This application Sept. 15, 1972, Ser. No. 289,654The portion of the term of this patent subsequent to July 9, 1991, has been disclaimed.

Int. Cl. G03b *27/02*

U.S. Cl. 355—132 **30 Claims**

1. A method of microfilming a set of radiographic x-rays with at least one of said x-rays having a varying contrast with respect to others of said x-rays, to be viewed on a single frame of microfilm inserted into an aperture card, comprising the steps of:

a. photographing said set of radiographic x-rays on said single frame of microfilm at a predetermined single exposure setting in a predetermined reduced contour dimension, said photographing to include transmitting light through said set of radiographic x-rays, said light having a non-uniform intensity subsequent to being transmitted through said set of radiographic x-rays;



b. developing said microfilm in accordance with said single exposure setting for adjusting a characteristic curve of said film to obtain a predetermined density range of said set of x-rays; and,

c. positioning said single frame on said aperture card.

3,851,969

COPYING MACHINE WITH TRAVELING LIGHT SOURCE

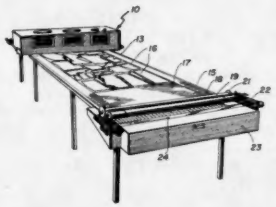
Hans Haus, 6250 Limxburg Lahn, Hahlgartenweg, Germany

Continuation of Ser. No. 245,852, April 20, 1972, abandoned. This application July 26, 1973, Ser. No. 382,856

Claims priority, application Germany, Apr. 21, 1971, 2119369

Int. Cl. G03b *27/02*

U.S. Cl. 355—132 **11 Claims**



1. A method of producing photographic copies of a configuration of patterns disposed on a copying table, whereby the pattern pieces are first laid on a transparent base sheet on the plane surface of the lay-marker table and secondly are covered by an overlying second sheet of transparent mesh material and thirdly a web of copy paper passed between the base sheet and table is exposed by a light source traversing said configuration of patterns,

characterized by the fact that prior to its exposure, a web of copy paper is advanced by the traversing of the light source across the exposure position in a straight line between the bottom face of the base sheet on the table and the plane surface of said table, that the web is exposed to said pattern pieces by the return movement of said light source to its starting position, and that after exposure said copy paper web is moved out of said position.

3,851,970

INSTRUMENT FOR MEASURING ULTRA-VIOLET LIGHT

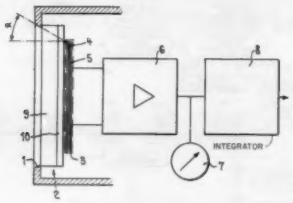
Karl Adler, Grenchen, and Georges Ducommon, Feldbrunnen, both of Switzerland, assignors to Biviator S.A., Grenchen, Switzerland

Filed Jan. 3, 1973, Ser. No. 320,708

Claims priority, application Switzerland, Jan. 14, 1972, 496/72

Int. Cl. G01n *21/34*; G01j *1/42*

U.S. Cl. 356—51 3 Claims



1. An instrument for the measure of the intensity of ultra-violet radiation comprising an optical converter for converting ultra-violet radiation into visible radiation, a photoelectric converter disposed adjacent said optical converter for transforming said visible radiation into an electrical signal, at least one infrared filter and at least one ultra-violet filter disposed one behind the other and having surfaces with dimensions such that the measuring cell has an aperture angle of at least 30°, said filters mounted in front of said optical converter and characterized in that said infrared filter has a thickness of at least 6 mm and said ultra-violet filter a thickness of at least 2 mm, said filters and said converters cooperatively exhibiting a spectral sensitivity only in the effective wavelength domain between 300 and 315 nm, and an amplifier, connecting the measuring cell with an indicator instrument, said amplifier having a transfer function coacting with the non-linear electrical signal from said photoelectric converter such that the reading from said indicator instrument is given in $\mu W/cm^2$ linearly in the range of at least 100 nW/cm^2 to 1 mW/cm^2.

3,851,971

APPARATUS FOR TESTING THE AUTHENTICITY OF PAPER CURRENCY

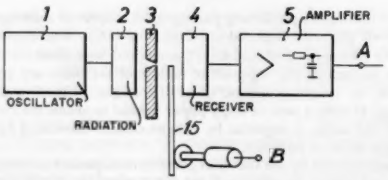
Jurgen Koch, Buxtehude, Germany, assignor to National Rejectors Inc., GmbH, Buxtehude, Germany

Filed Nov. 6, 1972, Ser. No. 304,091

Claims priority, application Germany, Jan. 29, 1972, 2204284

Int. Cl. G06k *9/08*; G01b *11/24*

U.S. Cl. 356—71 5 Claims



1. Apparatus for testing the authenticity of paper currency comprising, in combination, an oscillator emitting a radiation oscillating at a predetermined frequency, conveyor means conveying paper currency to be tested across the path of said radiation, said conveyor means generating a synchronizing signal for indicating the location of paper currency conveyed by said conveyor means, a receiver receiving radiation transmitted from said paper currency sensing the received radiation and producing an output signal determined only by the radiation received oscillating at substantially the same frequency as said predetermined frequency, said receiver comprising photoelectric means generating an AC output signal corresponding to the oscillating frequency of said radiation, an optical filter for transmitting radiation of essentially the same wave length as radiation emitted by said oscillator located between said conveyor means and said photoelectric means, sensing means sensing said output signal selectively generating an accept or reject signal as determined by said output signal, said sensing means including an amplifier amplifying selectively only AC voltages which lie within the range of the oscillating frequency of said radiation, an evaluating channel comprising a second amplifier, a band filter tuned to a preselected frequency and an amplitude discriminator in series with said first mentioned amplifier for receiving the output signal of said amplifier, a collecting stage in series with said evaluating channel for receiving the output signal from said evaluating channel, and means at said collecting stage for switching through said output signal from said evaluating channel at a preselected value of said synchronizing signal produced by said conveyor means.

3,851,972

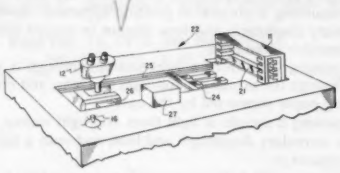
AUTOMATIC METHOD AND SYSTEM FOR ANALYSIS AND REVIEW OF A PLURALITY OF STORED SLIDES

Lester C. Smith, Newton Upper Falls; Garret F. Ziffer, and John Russell Nelson, both of Natick, all of Mass., assignors to Coulter Electronics Inc., Hialeah, Fla.

Filed Oct. 18, 1973, Ser. No. 407,538

Int. Cl. G01n *21/00*, *33/16*

U.S. Cl. 356—72 32 Claims



1. A system for automatically reviewing slides having biological cells thereon including in combination

sequencer means for developing a sequence of first control signals and a sequence of second control signals,

storage means for storing a plurality of slides to be studied, scanning means coupled to said sequencer means and said storage means and operative in response to each particular first control signal in said sequence to access a particular slide in said storage means, said scanning means being further operative in response to each particular second control signal in said sequence to locate a particular area on the accessed slide,

analyzing means coupled to said scanning means and said sequencer means for analyzing and detecting particular characteristics of each cell scanned on the accessed slide, said analyzing means being operative to develop a detect signal in response to each cell having characteristics other than said particular characteristics,

memory means coupled to said sequencer means and said analyzing means and having a plurality of storage locations, said memory means being operative in response to said detect signal to store in a particular storage location, said last developed first and second control signals,

said sequencer means including input means operative to develop a review signal, sequentially to access each of said plurality of storage locations and couple said particular first and second control signals located therein to said scanning means.

said scanning means being operative in response to said particular first and second control signals to access said particular slide and locate said particular area thereon.

3,851,973

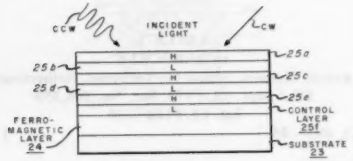
RING LASER MAGNETIC BIAS MIRROR COMPENSATED FOR NON-RECIPROCAL LOSS

Warren M. Macek, Huntington Station, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 3, 1972, Ser. No. 214,895

Int. Cl. G01b *9/02*; **G02f** *1/26*

U.S. Cl. 356—106 LR **15 Claims**



1. A ring laser comprising

means forming a closed loop optical cavity containing an active lasing medium for providing contradirectional light beams propagating along a closed loop circulatory path in the optical cavity,

said optical cavity forming means being constructed, at least in part, of a frequency biasing light reflective multilayer member for imparting a differential phase shift to the contradirectional beams, said multilayer member including a magnetizable layer coated with at least one dielectric layer which has a thickness determined in accordance with the refractive index of the dielectric layer and wavelength and angle of incidence of the contradirectional beams on the multilayer member for substantially eliminating differential reflection of the contradirectional beams normally occurring at the multilayer member from the presence of the magnetizable layer while preserving non-reciprocal phase shift caused thereby.

3,851,974

SYSTEM FOR OPTICAL ALIGNMENT AND ADJUSTMENT OF A LASER

Pierre-Emile Ravussin, Lausanne, and Jean-Pierre Vuille, Epalinges, both of Switzerland, assignors to OMEGA Louis Brandt & Frere S.A., Biel, Berne and Alcyon Electronique et Physique S.A., Renens, Vaud, both of, Switzerland

Filed May 7, 1973, Ser. No. 357,828

Claims priority, application Switzerland, May 30, 1972, 7959/72

Int. Cl. G01b *11/26*

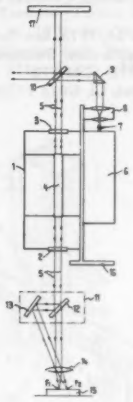
U.S. Cl. 356—153 **6 Claims**

1. A system for optical alignment and adjustment of a machining laser comprising

a base member,

a machining laser and an auxiliary, alignment laser fixedly mounted on said base member, and

means directing the output beam of said auxiliary laser through the active element of said machining laser in super-position with the output beam of said machining laser whereby alignment of a workpiece with respect to



said auxiliary laser beam accurately determines the point of application of said machining laser beam.

3,851,975

OPTICAL METHOD AND APPARATUS FOR DETECTION OF DEFECTS

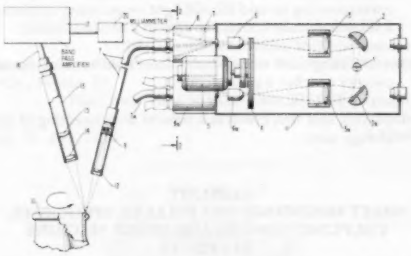
Gerard Serret, Paris, France, assignor to Saint-Gobain Industries

Filed Oct. 8, 1969, Ser. No. 864,624

Claims priority, application France, Oct. 9, 1968, 68.169187

Int. Cl. G01n *21/32*

U.S. Cl. 356—198 **4 Claims**



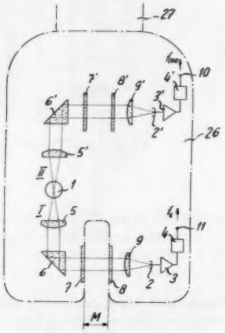
1. A method of examining a transparent object which comprises projecting onto the object at a single examining station by separate elongated vitreous light conducting means a plurality of focused modulated light beams having different modulated frequencies; transforming into separate modulated electrical signals of different modulated frequencies, by means of separate photoelectric cells, modulated light coming from the object and from said separate beams; amplifying said separate electrical signals in separate amplifiers passing only the frequencies of modulation of those signals respectively; and delivering the amplified modulated signals to separate detectors of signal deviations.

3,851,976

METHOD FOR DETERMINING THE TRANSLUCENCY AND/OR TURBIDITY OF A MEDIUM AND APPARATUS FOR APPLYING THE METHOD

Johann Meier, Casa Clarissa, CH-6645 Brione sopra Minusio, Switzerland

Filed Jan. 24, 1973, Ser. No. 326,171
Claims priority, application Switzerland, Jan. 26, 1972, 1113/72; Aug. 18, 1972, 12248/72
Int. Cl. G01n 21/26
U.S. Cl. 356—206 10 Claims



1. A method for determining the transparency of a medium comprising the steps of:

producing a first and second light beam from a single light source;

passing said first light beam through said medium;

converting first and second light beams to first and second analog voltages proportional to light beam intensity;

converting said first and second analog voltages to first and second corresponding analog frequencies, the frequency corresponding to said first light beam being applied to a first decade counter to obtain a first count, the frequency corresponding to said second light beam being applied to a second decade counter to obtain a second count;

storing said first count in a storage unit;

disconnecting said storage unit when said second decade counter reaches a preset count;

resetting said decade counters; and

displaying said first count at a time of disconnecting of said storage unit.

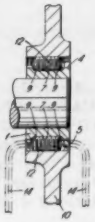
3,851,977

SHAFT MOUNTINGS FOR PULLEYS, SPROCKETS, COUPLING FLANGES AND OTHER MACHINE ELEMENTS

Rex Boole, Croydon, England, assignor to The Wellman Bibby Company Limited, Croydon, Surrey, England

Continuation of Ser. No. 880,700, Nov. 28, 1969, abandoned. This application Dec. 15, 1971, Ser. No. 208,201
Int. Cl. F16d 1/06
U.S. Cl. 403—16 7 Claims

1. A machine part mounted on a shaft through the intermediary of a split contractible tapered bush and at least two locking screws extending substantially parallel to said shaft, each of said screws being contained for at least the major portion of its length partly in a recess in the bore of the machine part and partly in a registering recess in the tapered surface of the bush, at least one recess in the tapered surface of the bush being threaded and arranged to cooperate with a plain recess in the surface of the bore of the machine part, the ends of said plain recess being defined by two opposed shoulders or abutments, means being provided which enable access



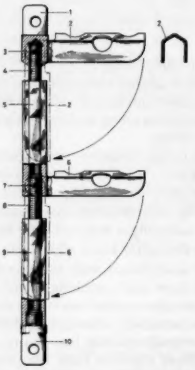
for actuation of both of said screws from each end of said bush.

3,851,978

TURNBUCKLE

Syize Arnold Kuipers, Stripe 11, Terhorne, Netherlands

Filed Sept. 12, 1973, Ser. No. 396,359
Int. Cl. F16b 7/06
U.S. Cl. 403—45 1 Claim



1. A turnbuckle comprising three oblong sections which are screwed together in a direct line with an internally threaded sleeve end section and an externally threaded rod end section oppositely threaded respectively to opposite ends of the centre section of the turnbuckle, and two channel-sectioned locking arms pivoted to the center section and one of said end sections respectively about an axis transverse to the sections such that a substantially channel-sectioned portion of each of said locking arms can be brought into tight-fitting engagement with a hexagonal outer circumference of an adjacent sleeve portion for preventing relative rotation of the three sections, one of the two end sections (3, 9) being in the form of an internally threaded sleeve (9) screwed onto an externally threaded rod portion (8) of the middle section (5, 8).

3,851,979

CABLE AND HOSE CLAMP

William K. Becker, Portage, Mich., assignor to Daniel Woodhead, Inc., Northbrook, Ill.

Filed Sept. 20, 1972, Ser. No. 290,759
Int. Cl. F16l 27/02
U.S. Cl. 403—76 11 Claims

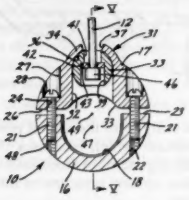
1. A clamping structure for effecting a universal connection between a cable and a hose, said structure comprising:

first and second arcuate clamping members which, when positioned adjacent one another in opposed relationship, define an annulus for encircling and clampingly engaging said hose, said annulus defining a central opening adopted to receive said hose;

one of said arcuate clamping members having a substantially radially extending opening formed therein substantially midway between the ends thereof, said one clamping member also having annular lip means fixed thereon and partially closing the radially outer end of said radially extending opening, said annular lip means having a radially inner wall defining a partial spherical bearing surface;

threaded connecting means for fixedly connecting said first and second clamping members in encircling and clamping engagement with said hose; and

swivel means mounted solely on said one clamping member for connection to an end of said cable for enabling universal swivelling movement of said cable relative to said annulus, said swivel means including ball-like swivel member movably supported solely on said one clamping member, said ball-like swivel member being disposed within said radially extending opening and positioned in bearing engagement with the partial spherical bearing surface defined by said annular lip means, and means for connecting said one end of said cable to said ball-like swivel member.

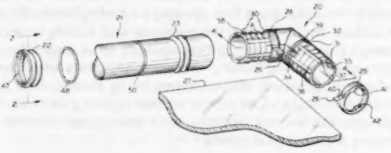


3,851,980

TUBING CONNECTOR

Lewis R. Worth, 21 E. Greenbriar Dr., Deerfield, Ill. 60015, and Maynard H. Cheris, 2485 St. Johns, Highland Park, Ill. 60035

Filed Apr. 19, 1974, Ser. No. 462,246
Int. Cl. E04g *7/00*
U.S. Cl. 403—172 **18 Claims**



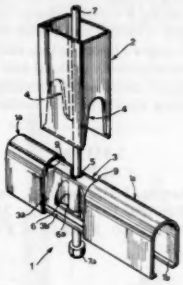
1. A tubing connector comprising a joining member having at least one arm with an outer surface bearing a plurality of rows of ratchet-like teeth, the rows being arranged in a spaced parallel relationship separated by aisles, ring means having an external tab and at least one internal tooth which matches with and passes down an aisle between two of said rows, when said ring is slipped over said arm, whereby the tab may be rotated to any of many alternative angular settings by the expedient of removing, rotating, and replacing the rings.

3,851,981

ASSEMBLY FOR FORMING METAL FURNITURE STRUCTURES FROM INTERENGAGING ELEMENT

Piero Corsi, Milan, and Emilio Turco, Massa, both of Italy, assignors to Siam 1922 Societa' Italiana Arredamenti Metallici S.p.A., Settimo Torinese (Turin), Italy

Filed Sept. 15, 1972, Ser. No. 289,386
Claims priority, application Italy, Dec. 10, 1971, 71040/71
Int. Cl. F16m *11/20*; **A47f** *3/00*
U.S. Cl. 403—237 **3 Claims**



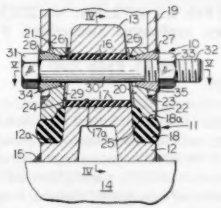
1. An assembly of component parts adapted to be assembled to form furniture such as tables, shelving and the like, said assembly comprising at least one first and second elongate elements adapted to fit together, the first element having a channel section with divergent side walls and the second element having a forked end, the internal profile of said forked end being complementary to the external cross-sectional profile of the first element and a tie member adapted to hold said elements tightly interengaged upon assembly thereof, said first element being of sheet metal and including a cut out portion in each side wall which are deformed inwardly with respect to said side walls so that the edges of said cut out portions define an internal abutment within said first element which constitutes a reaction support for one end of said tie member.

3,851,982

SHOCK CUSHIONING MOUNTING MEANS FOR VEHICLE ATTACHMENTS

George L. See, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 10, 1972, Ser. No. 279,695
Int. Cl. F16b *7/18*
U.S. Cl. 403—224 **8 Claims**



1. A resilient mounting assembly for attaching canopy structures to vehicles, said assembly comprising:

a base member;

a tapered bayonet mount extending upward from said base member;

a support member having a tapered socket for receiving said bayonet mount;

said base member and said support member each including a shoulder disposed in opposed relation;

resilient means disposed between said shoulders for supporting said support member in spaced relation to said bayonet mount;

a pair of aligned bores extending transversely through said socket means;

a bore extending transversely through said bayonet means and partially aligned with said bores in said socket means;

a bolt extending through said bores; and,

cam means including a tapered sleeve carried by each end of said bolt and with the small ends thereof terminating in said pair of aligned bores to bias said shoulders toward one another to adjustably preload said resilient means so that said support member is normally supported in its vertical direction wholly by said resilient means.

3,851,983

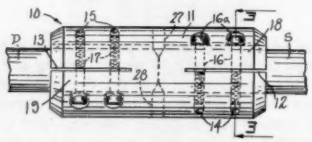
COUPLING

Kenneth H. MacKenzie, 3 Morgan Ter., East Haven, Conn.

Filed Feb. 20, 1973, Ser. No. 334,028

Int. Cl. F16b *7/00*; **F16d** *1/00*; **F16l** *21/00*

U.S. Cl. 403—312 **3 Claims**



1. For use in combination with a drive and a driven shaft, a coupling comprising a one-piece sleeve member having a continuous bore therethrough, a pair of slots defined in said sleeve member at each end thereof and extending longitudinally inwardly of said sleeve member, the slots of each pair terminating in said sleeve short of each other, said pairs of slots permitting each end of said coupling to be tightened on a shaft independent of the other end, threaded screw holes extending through said coupling and bridging each of said slots, a screw received in each of said holes, said screws being effective to clamp the slotted ends of said coupling about each of said shafts.

3,851,984

REMOVABLE ATTACHMENT FOR A HAND APPLIANCE FOR BODY CARE INCLUDING COUPLING RETAINING MEANS

Jean-Pierre Crippa, Geneva, Switzerland, assignor to Les Produits Associes SA, Geneva, Switzerland

Filed Feb. 23, 1972, Ser. No. 228,574

Claims priority, application Switzerland, Feb. 26, 1971, 2859/71

Int. Cl. F16b *7/00*

U.S. Cl. 403—322 **7 Claims**

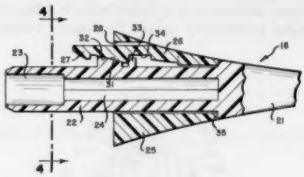
1. Coupling retaining means for releasably retaining the coupling of a removable attachment to a hand appliance for body care having an output member, an outwardly extending detent member transversely spaced from the output member, and a control member slidably parallel to said output member and adapted to overlap said detent member in spaced relationship thereto, said removable attachment including a body portion having a working head toward the front end thereof and an elongated coupling section at the rear end thereof adapted for coupling with said output member of the hand appliance, said coupling retaining means comprising

a. a coupling retaining member slidably mounted on said elongated coupling section of the attachment for movement therealong,

b. said coupling retaining member including a spring arm extending longitudinally of said elongated coupling section with the rear end free for flexible movement outwardly from the elongated section,

c. a detent on the inner side of said free end of the spring arm for engaging said outwardly extending detent member of the hand appliance,

d. cooperating cam surfaces on said elongated coupling section and said spring arm, respectively, for moving said



free end outwardly from the detent position thereof upon relative movement which increases the distance of the coupling retaining member from said working head,

e. and stop means on said attachment for limiting said relative movement,

f. the inner surface of said control member of the hand appliance and the outer surface of said spring arm of the attachment being designed and adapted to prevent disengagement of the detent from said detent member in a predetermined forward position of the control member.

3,851,985

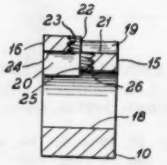
COLLAR AND METHOD OF MAKING SAME

Raymond C. Coleman, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 20, 1972, Ser. No. 290,445

Int. Cl. B22f *3/24*

U.S. Cl. 403—362 **6 Claims**



1. An article adapted for mounting on a member and detachably secured thereon by a threaded element comprising a one-piece body having a first opening extending inwardly from one surface for receiving the member and having a second opening extending from the first opening at an angle thereto, said second opening having threaded segments of a partial annular configuration, said segments being axially offset from each other along an axis of the second opening and coacting to provide the second opening with interrupted threads for receiving a threaded element.

3,851,986

UTILITY INSTRUMENT

Albert E. Daughtry, 700 Wilkes Dr., Eugene, Oreg. 97402

Filed Sept. 29, 1972, Ser. No. 293,563

Int. Cl. A01b *1/22*

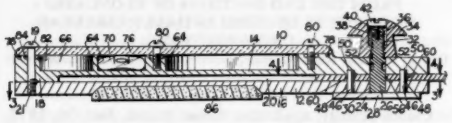
U.S. Cl. 403—373 **4 Claims**

1. A utility instrument comprising

a. a handle having forward and rearward ends,

b. said handle including a longitudinal edge slot therein forming a pair of handle portions,

c. said handle portions each having a first aperture therethrough adjacent to the forward end of the handle with the said apertures being in axial alignment,
d. one of said handle portions also having a pair of second apertures therethrough one of which is disposed on one side of said first aperture and the other of which is disposed on the other side of said aperture,
e. an implement having forward and rearward ends and including a relatively flat shank portion arranged to be received in said slot,
f. said shank adjacent to its rearward end having a substantially circular pivot aperture and a pair of aligning apertures one on each side of the pivot aperture,
g. said shank also having a transverse slot extending from its pivot aperture to a side edge of the shank,
h. the width of said transverse slot being less than the diameter of said pivot aperture,
i. a lock member having a cross head,
j. a pivot post on said cross head extending through said first aperture in the handle portions and through the pivot aperture in said shank,
k. the diameter of said pivot post being less than said pivot aperture but greater than the width of said transverse slot,
l. means defining a reduced diameter portion on said post intermediate the ends thereof of less dimension than the width of said slot,



m. a pair of aligning pins on said cross head one on each side of said pivot post and extending through said second apertures in the one handle portion and arranged to extend through said aligning apertures in said shank to hold said implement in substantial longitudinal alignment with the handle,
n. and releasable means on the opposite end of said pivot post from said cross head,
o. said releasable means being operative on said post to provide axial movement of the latter to three positions in the first of which the post and aligning pins are pulled in tightly to position the aligning pins in said second apertures and aligning apertures to hold the implement in a secured position, in the second of which the post and aligning pins are released to a position such that the latter are withdrawn from said aligning apertures and said reduced diameter portion is out of alignment with the slot in the handle to permit the implement to pivot between an extended position and a stored position in said slot in the handle and vice versa, and in the third of which the post and aligning pins are released to an intermediate position such that the latter are withdrawn from said aligning apertures and said reduced diameter portion of said post is in alignment with the slot in the handle whereby said shank portion can be detached from the handle by moving it laterally with the said reduced diameter portion of said post moving through said transverse slot.

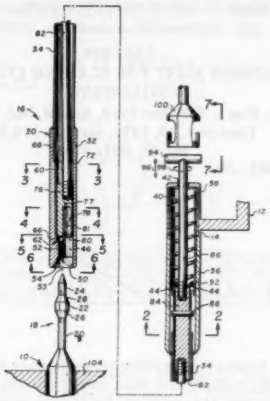
3,851,987

ECCENTRIC COUPLING MEANS

Thomas Alan Jones, Bolton, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 29, 1972, Ser. No. 319,954
Int. Cl. F16d *1/00*
U.S. Cl. 403—374 **13 Claims**

1. Coupling means including male and female connectors, movable longitudinally and laterally relative to one another:
a. said male connector including a male member having a neck portion and a laterally enlarged head portion longitudinally outwardly thereon for insertion into said female connector; and
b. said female connector comprising a housing having a longitudinally extending passage therein for entry and egress of said male member and a chamber at the inner end of said passage only partially in registry therewith for receiving said male member head portion, a laterally extending shoulder connecting said passage and chamber and comprising a retaining surface for said head portion and including:
i. operating means in said chamber supported for rotation relative thereto about a longitudinally extending axis and



having means therewith eccentrically disposed relative to said axis of rotation for laterally engaging said male member in said chamber, and,
ii. actuating means for rotating said operating means relative to said chamber between first and second positions, said eccentricity and said first and second rotational positions being such that said engaging means is in male member receiving or discharging alignment with said passage in said first position and is displaced toward said retaining surface sufficiently to locate part of said head portion in longitudinal alignment with said retaining surface in said second position, said operating means acting longitudinally in cooperation with said retaining surface to prevent withdrawal of said male member from said female connector in said second position.

3,851,988

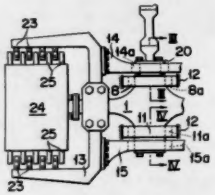
SELF-PROPELLING SOIL-COMPACTOR

Kenzaburo Kitai, Yokohama, and Mizuho Tomita, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 19, 1974, Ser. No. 452,643
Claims priority, application Japan, Mar. 19, 1973, 48-32627
Int. Cl. E01c *19/26*
U.S. Cl. 404—129 **4 Claims**

1. A self-propelling soil-compactor comprising wheel drums, an axle housing having cylindrical extension parts at its longitudinal front and rear sides and a wheel drum cleaning device which consists of cleaner bars attached to both the

right and left sides of said axle housing, means for supporting said axle housing rotatably about the longitudinal axis of said



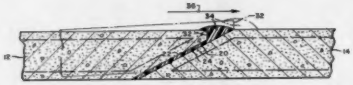
axle housing, and means for supporting said cleaner bars rotatably about the axis of said axle housing.

3,851,989

EXPANSION JOINT FOR SLABS OF CONCRETE ROADWAYS

Robert W. Peach, 888 Pine Trail, Arnold, Md. 21012

Filed Nov. 29, 1972, Ser. No. 310,201
Int. Cl. E01c *11/04*
U.S. Cl. 404—50 **1 Claim**



1. In a roadway comprising concrete slabs laid end-to-end relationship each of said slabs having laterally spaced sides, transverse ends, and upper and lower faces, an expansion joint between the ends of adjacent slabs comprising an upwardly facing slope at one end of one slab extending between the upper and lower faces thereof in a unitary plane, a downwardly facing slope at the adjacent end of the next slab and overlying in complementary relationship the slope of said first slab, said slopes having a predetermined angle relative to a vertical plane enabling the downwardly facing slope to slide up the upwardly facing slope upon thermal expansion of the slabs against each other, and enabling said first slope to slide down said second slope solely under the influence of gravity upon thermal contraction of said slabs, said sloping ends being normally spaced slightly apart with sealing material filling the space between said ends, the upper transverse edge of the end having the downwardly facing slope being truncated and both of said ends being reinforced to resist bending stresses in a vertical direction.

3,851,990

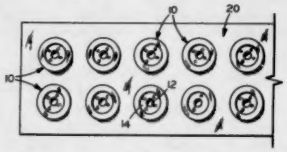
DISPOSABLE DRILL GUIDE AND METHOD FOR DRILLING WORKPIECES

Robert F. West, West Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Nov. 19, 1973, Ser. No. 417,480
Int. Cl. B23b *49/02*
U.S. Cl. 408—1 **10 Claims**

1. A drill guide for guiding a drill bit into contact with a predetermined location on the surface of a workpiece comprising:

a. a guide member formed of relatively soft material and having substantial thickness providing generally parallel top and bottom surfaces, said guide member having a guide passage of generally circular cross section therethrough from said top to said bottom surface whereby the guide passage of the drill guide may be aligned over the desired location of the workpiece, said passage having an outwardly flaring portion adjacent the upper end thereof to provide a guide surface for directing the drill bit into the center of the passage portion at the lower end thereof;



and

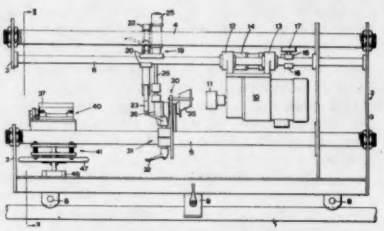
b. adhesive means on said lower surface for securing said guide member on the surface of the workpiece.

3,851,991

APPARATUS FOR THE AUTOMATIC OR SEMI-AUTOMATIC REMOVAL OF SURPLUS MATERIAL FROM THE END PORTIONS OF ELONGATE WORKPIECES OF SUBSTANTIALLY CIRCULAR CROSS-SECTION

Derek William Ross Walker, Four Gates, Claverley, Wolverhampton, England

Filed Nov. 30, 1973, Ser. No. 420,693
Claims priority, application Great Britain, Nov. 30, 1972, 55313/72; Jan. 19, 1973, 2868/73
Int. Cl. B23b *39/22*
U.S. Cl. 408—37 **20 Claims**

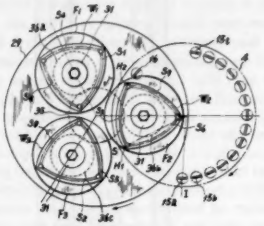


1. Apparatus for the removal of surplus material from the end portions of elongate workpieces of substantially circular cross-section comprising in combination, frame means, horizontally disposed slide means mounted on said frame means, a pair of opposed co-axial cutting heads slidably mounted on said slide means, each of said cutting heads being drivingly connected to a rotary cutter, means for moving said cutting heads and said cutters towards and away from each other for engaging end portions of an elongate workpiece, contact face means on said cutter for centering a workpiece automatically upon simultaneous engagement of said face means with said end portions, holding means for holding a workpiece in substantially co-axial disposition with the axis of rotation of said cutters and comprising resiliently mounted workpiece support means, ramp means for supplying workpieces to said holding means, workpiece stop means for stopping a workpiece descending said ramp means on said support means at a point adjacent to a vertical plane through said axis, and control means for controlling the operation of said moving means and said holding means.

3,851,992
GROOVING MACHINE TOOL

Kingo Sawada, Kariyashi; Masaaki Mizuno, Kariya, and Mabayoshi Ogihara, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Aichi-ken, Japan

Filed June 13, 1973, Ser. No. 369,484
Claims priority, application Japan, June 13, 1972, 47-58257
Int. Cl. B23b 41/00
U.S. Cl. 408—54 10 Claims

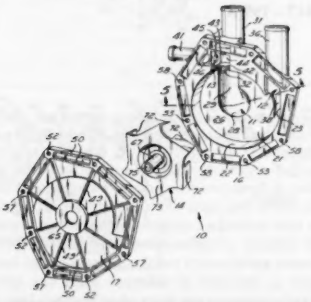


1. A machine tool for forming arcuate grooves on a plurality of workpieces comprising:
a base;
a work head provided on said base;
a spindle head slidably mounted on said base and movable toward and away from said work head;
a work spindle rotatably mounted in said work head;
a tool spindle rotatably supported in said spindle head;
a tool holder fixedly mounted on said tool spindle at the end thereof and having a series of cutting tools around the peripheral portion thereof;
an index table secured to one end of said work spindle and including means mounted thereon for supporting said workpieces for rotation about their axes;
indexing means provided for simultaneously turning each of the workpieces around the axis thereof and around the axis of said work spindle through respective predetermind amounts so as to sequentially index the workpieces into a machining position; and synchronizing means for actuating said indexing means in accordance with the rotation of said tool spindle.

3,851,993
WASHING MACHINE PUMP

James R. Foster, Webster, Iowa, assignor to Franklin Manufacturing Company, St. Cloud, Minn.

Filed Apr. 16, 1973, Ser. No. 351,630
Int. Cl. F04d 5/00
U.S. Cl. 415—53 15 Claims

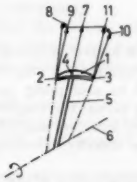


1. A reversible pump for a laundry appliance having an internal impeller cavity, an inlet and a main outlet communicating separately with said impeller cavity, an impeller rotatable within said cavity, said impeller including means to pump said water from said inlet to said outlet with positive displacement action when driven in a first direction during a pump out mode, a secondary outlet communicating with said impeller cavity, said impeller including means to pump water from said inlet through said secondary outlet port when driven in an opposite direction in a recirculation mode, and bypass means between said inlet means and said auxiliary outlet means to control pressure in said main outlet when said impeller is rotating in said recirculation mode.

3,851,994
BLADING FOR AXIAL FLOW TURBO-MACHINE

Claude Seippel, Zurich, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jan. 12, 1973, Ser. No. 323,094
Claims priority, application Switzerland, Jan. 20, 1972, 76772/72
Int. Cl. F01d 5/14
U.S. Cl. 416—223 2 Claims



1. The improvement in turbine blading for the rotor of a turbo-machine of the axial-flow type wherein for the purpose of allowing a high ratio of external to internal diameter of the flow passageway each of the blades is given a twist about its horizontal axis which is determined at least approximately in accordance with the equation

$$d\beta/dr = T/P \cdot A/I_1 + I_2 \text{ wherein}$$

r is the axial pitch of any blade section on which the following values are based.
β is the angle between the principal inertia axis and the circumferential direction.
$d\beta/dr$ is the degree of blade twist
T is the resultant torsion moment of the blade part from the distance r to the end of the blade
P is the resultant tension force of this part of the blade
A is the cross-sectional area of the profile, and
I_1, I_2 are the maximum and minimum moments of inertia of the blade profile

thereby maintaining constant the amount of the blade twist under the influence of centrifugal forces acting thereon when the motor is operating.

3,851,995
PUMP-OFF CONTROL APPARATUS FOR A PUMP JACK

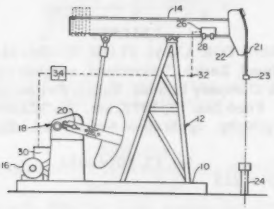
M. Dee Mills, Box 5554, Midland, Tex. 79701

Filed Aug. 6, 1973, Ser. No. 386,075
Int. Cl. F04b 49/00
U.S. Cl. 417—12 6 Claims

1. A control system for the control of a prime mover of an oil well pump jack apparatus which drives a downhole pump by means of a rod string comprising:
control means by which the prime mover is selectively energized and de-energized;
first switch means mounted to be moved into a conducting configuration during the pump downstroke;
second switch means mounted to be moved into a conducting configuration upon an abnormal movement of the rod string indicative of fluid pounding;

circuit means connected to said first and second switch means and to said control means for counting the number of times said second switch means is closed and for causing said control means to de-energize said prime mover after said second switch means has been moved to the closed position a plurality of times;

a third switch means, said third switch means being a magnetically actuated switch, a magnet for actuating the last



said switch when the magnet is moved into close proximity thereof, said magnet being magnetically attached to structure mounted to said pump jack means so that should a rod string break, the magnet will be forced to move relative to said structure and into proximity of said third switch means, thereby actuating said third switch means; and,

circuit means by which actuation of said third switch means causes said prime mover to be de-energized.

3,851,996

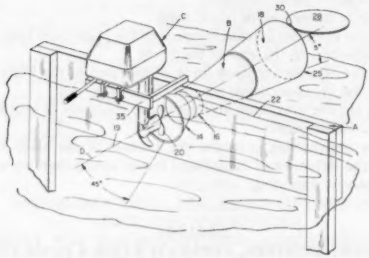
OUTBOARD MOTOR POWERED LOW LIFT PUMP

John L. Winther, 263 Calle La Mesa, Moraga, Calif. 94556

Filed Jan. 30, 1974, Ser. No. 438,088

Int. Cl. F04b *21/00;* **F01d** *25/28*

U.S. Cl. 417—61 **9 Claims**



1. An outboard motor powered low head, high volume pump for pumping water from an inlet to an outlet comprising: a weir structure separating the inlet from the outlet; a Venturi tube transpiercing said weir structure, said Venturi tube having an acceleration chamber communicated to said inlet, a decleration tube communicated to said outlet and a throat section therebetween; and, an outboard motor having a water discharge means for mounting said outboard motor in front of said acceleration chamber of said Venturi tube with said water discharge directed into said acceleration chamber.

3,851,997

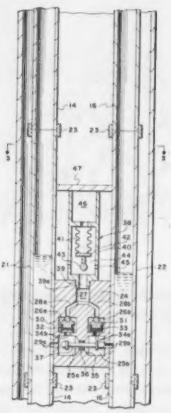
DUAL STRING AUTOMATIC GAS LIFT VALVE

Bobby L. Douglas, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 1, 1974, Ser. No. 447,130

Int. Cl. F04f *1/18;* **G05d** *11/00*

U.S. Cl. 417—112 **15 Claims**



1. A dual string, gas lift injection valve assembly comprising:

body means adapted to engage two strings of conduit;

passage means in said body arranged to communicate with the strings of conduit;

checkvalve means in said passage means adapted to allow fluid flow through said passage means in one direction only;

pressure responsive valve means in said passage means communicating with the conduit strings, said pressure responsive means arranged in said passage means to receive fluid pressure from the conduit strings and to move responsively thereto to open and close said passage means alternatively to each of the conduit strings; and

means on said body means for delivering pressurized gas to said passage means.

3,851,998

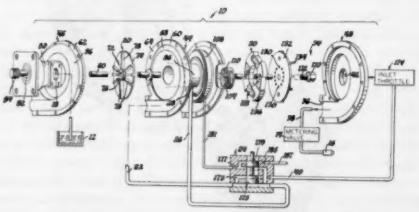
COMPACT HIGH SPEED FUEL PUMP ASSEMBLY

Noel L. Downing, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed June 15, 1973, Ser. No. 370,417

Int. Cl. F04b *23/14;* **F03c** *3/00*

U.S. Cl. 417—199 A **7 Claims**



1. A pump assembly for producing a high pressure output during a start phase of operation, housing means forming a chamber having an inlet and an outlet thereto, a rotatable shaft directed through said housing driven between first and

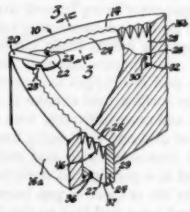
second speeds, a rotor located within said chamber radially outwardly of said rotatable shaft including a radially inwardly located central bore therein concentric of said rotatable shaft, coupling means connecting said rotor to said shaft for concurrent rotation therewith, means forming a stationary cam member within said rotor bore having an outer periphery eccentric to said shaft for forming a pump chamber with said rotor in communication with said inlet and outlet, said rotor having a plurality of radial slots therein each opening into said central bore therethrough, a vane located in each of said slots including a radially inner located tip thereon located in sliding engagement with the outer periphery of said cam member for displacing fluid from said chamber between said inlet and outlet, spring means having a predetermined rate for biasing said vanes into sealed engagement with said cam periphery during a start phase of operation between first and second predetermined speeds wherein said vanes positively displace fluid to cause a high lift flow of fluid from the inlet to the outlet of said pump chamber to produce a high pressure fluid discharge during the start phase of operation, said vanes being responsive to centrifugal action at said second predetermined speed to compress said spring means and to move radially outwardly within said slots to disengage the inner tips thereof from the outer periphery of said stationary cam thereby to terminate the positive displacement of fluid from said inlet to said outlet at said second predetermined speed and to reduce frictional wear between said vanes and said cam when said shaft is driven at said second predetermined speed.

3,851,999

SEALING ASSEMBLY

William H. Bibbens, 16500 N. Park Dr., Southfield, Mich. 48075

Filed Dec. 5, 1972, Ser. No. 312,408
Int. Cl. F01c *19/00*
U.S. Cl. 418—142 **36 Claims**



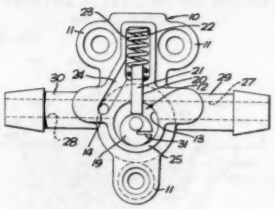
1. A rotary device for eccentric rotor machines comprising: a rotor having an end face lying in a plane substantially normal to the axis of rotation of said rotor; an elongated groove formed in said end face, said groove having a pair of spaced side walls; an elongated sealing strip received in said groove, said sealing strip having an outer edge and a pair of spaced side surfaces; biasing means engaged between said rotor and sealing strip biasing said outer edge to project from said groove; and interengageable force transmitting means on said sealing strip and rotor operable in response to longitudinal forces on said outer edge to apply transverse and axial forces on said sealing strip in a direction to simultaneously urge one of said surfaces into sealing engagement with one side wall of said groove and said outer edge outwardly of said groove.

3,852,000

FLEXIBLE ROTOR FOR FLUID PUMPS

Kenneth John Wilcox, Cyncoed, Cardiff, Wales, assignor to Tudor Accessories Limited, Hayes, Middlesex, England

Filed Oct. 24, 1972, Ser. No. 299,776
Claims priority, application Great Britain, Oct. 25, 1971, 49533/71
Int. Cl. F01c *5/02*
U.S. Cl. 418—156 **4 Claims**



1. A fluid pump comprising:
a circular chamber the interior of which has parallel opposed walls and a peripheral wall;
an inlet port and an outlet port communicating with said chamber;
a vane reciprocally mounted in said peripheral wall of said chamber between said inlet and outlet ports for sliding engagement with said opposed parallel walls of said chamber;
a circular rotor eccentrically mounted within said chamber and having two opposed faces thereon permanently in sliding engagement with said parallel opposed walls of said chamber and a peripheral surface a part only of which slidably engages said peripheral wall of said chamber as the rotor rotates eccentrically about the central axis of said chamber;
means urging said vane into engagement with the periphery of said rotor;
an enlcosed space outside said chamber into which a part of said vane projects;
and a passage placing said space into direct communication with said outlet port of the fluid pump;
characterized in that said part of the rotor which slidably engages said peripheral wall of the chamber is resiliently flexible towards and away from the axis of rotation of the rotor;
and in that the rotor is formed with an axial open ended slot which extends inwardly from an edge of the rotor between said port of the rotor which engages said peripheral wall of the chamber and the axis of rotation of the rotor.

3,852,001

FLUID TRANSLATOR

Edward T. Miller, Corpus Christi, Tex., assignor to R. J. Pollard, San Marcos, Tex., a part interest

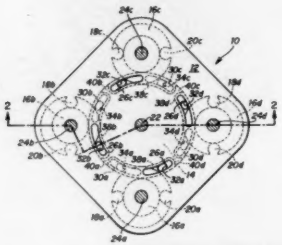
Filed Apr. 26, 1973, Ser. No. 354,802
Int. Cl. F01c *1/08*
U.S. Cl. 418—196 **13 Claims**

1. A rotary motor comprising:
a casing having opposed walls with elongate slots symmetrically formed through said walls,
a circular rotor rotatably mounted between said opposed walls and having grooved portions extending into the periphery of said rotor and spaced about the periphery thereof to define a plurality of piston surfaces, the outer surfaces of said piston surfaces being adjacent the periphery of said rotor,
pressure inlet and exhaust outlet ports formed through opposed sidewalls of said rotor to communicate with said grooved portions, said ports periodically communicating

with said slots in said walls during rotation of said rotor,

a plurality of circular cylinder heads rotatably mounted between said opposed walls and spaced about the periphery of said rotor such that outer portions of said cylinder heads mate with and are closely received within said grooved portions,

plural cylinder grooves being defined in the edges of each said cylinder head, said cylinder grooves being dimensioned for receiving said piston surfaces,



means for synchronizing the rotation of said cylinder heads with said rotor, and

means for applying pressurized fluid through said slots in one of said walls and through said pressure inlet ports into said grooved portions in order to rotate said rotor and said cylinder heads, said pressurized fluid being exhausted from said grooved portions through said exhaust outlet ports and through said slots formed in one of said walls.

3,852,002

GYRATING-CAM ENGINE, PARTICULARLY AS A HYDRAULIC ENGINE

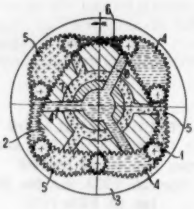
Bohdan Sieniawski, Gdansk-Oliwa, Poland, assignor to Zaklady Urzadzen Okretowych "Hydroster", Gdansk, Poland

Filed Nov. 28, 1972, Ser. No. 310,077

Claims priority, application Poland, Dec. 1, 1971, 151883

Int. Cl. F01c *1/42;* **F03c** *3/00;* **F04c** *1/16*

U.S. Cl. 418—61 R **3 Claims**



1. A gyrating-cam hydraulic engine, comprising an outer cam, an inner cam mounted concentrically within said outer cam and forming a space therebetween and rotating toothed planet gears mounted between and in engagement with said cams and separating said space into working chambers, said inner and outer cams having toothed lobes, said inner cam having three lobes and said outer cam having a number of lobes exceeding the number of lobes of said inner cam by at least one, one of said cams being stationary and the other of said cams being rotatable.

3,852,003

PRESSURE-SEALED COMPRESSOR

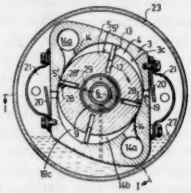
Gerhard Adalbert; Jurgen Hess, both of Markgroningen, and Ernst Linder, Muhlacker, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed May 10, 1973, Ser. No. 359,030

Claims priority, application Germany, May 12, 1972, 2223156

Int. Cl. F04c *27/00*

U.S. Cl. 418—93 **10 Claims**



1. Pressure-sealed compressor comprising housing means including a central housing part having a cylindrical cavity surrounded by an endless inner actuator surface, a pair of end walls closing the ends of said cavity and having confronting stationary faces, a tubular pintle on one of said end walls, and inlet and outlet means for a fluid, said housing means further including a container for high pressure fluid communicating with said outlet means and having an outlet for high pressure fluid; rotor means mounted on said housing means for rotation about an axis, and including a rotor having rotor end faces slidingly engaging said stationary faces and forming clearing gaps therewith, a drive shaft portion mounted in said tubular pintle for rotation and including a thin shaft portion formed with an annular recess, and a plurality of vanes respectively mounted in radial slots of said rotor and having outer ends slidingly engaging said actuator surface for forming expanding and contracting chambers between said rotor and said actuator surface, said inlet and outlet means communicating with said chambers, said rotor being formed with an annular space surrounding said pintle and connecting radially inner ends of said slots; said housing means being formed with duct means connecting said outlet means and said annular space so that high pressure in said slots urges said vanes into engagement with said actuator surface, said annular recess forming part of said duct means and communicating with said annular space; and at least one of said end walls being formed with a conduit having one end connected with said outlet means and the other end formed as a port in said stationary face of said end wall opening into the respective gap between the respective stationary face and rotor end face so that fluid is pressed into said gap for sealing the same against leakage.

3,852,004

GEAR PUMPS

Kenneth William Samuel Foster, Prestbury, and Neil McIntosh Wallace, Stockport, both of England, assignors to Renold Limited, Manchester, England

Filed Feb. 22, 1973, Ser. No. 334,802

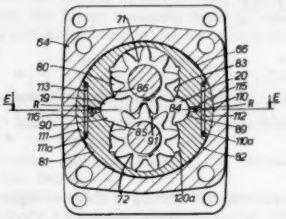
Claims priority, application Great Britain, Feb. 25, 1972, 8764/72

Int. Cl. F01c *19/08*

U.S. Cl. 418—131 **30 Claims**

1. A reversible high pressure gear pump which will function also as a motor, comprising: a pair of externally meshing gears operating in a pump cavity within a pump casing to define with

cylindrically-walled wall portions and confronting side wall portions of the cavity a high pressure zone in the cavity, the pump cavity being defined in part by an insert presenting two sets of said cylindrically-walled wall portions in confronting relationship with one another said insert being displaceable in the casing relative to said confronting side wall portions of the pump cavity and transversely of the axes of rotation of the



gears to load either set of its cylindrically-walled portions into sealing engagement with the tips of the gear teeth and to move the other set out of engagement with the tips of the gear teeth whereby the fluid inlet to the pump cavity, for that period of time, is always in communication with a zone thereof which extends around a major portion of the periphery of said gears during operation of the pump, to pump fluid in either direction.

3,852,005

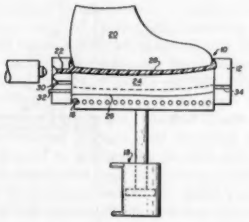
APPARATUS FOR MOLDING RUBBER

Marvin Americo Sculati, and John Cornelius Gaynor, both of Dublin, Ga., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 203,697, Dec. 1, 1971, abandoned. This application July 25, 1973, Ser. No. 382,414

Int. Cl. B29c *9/00*; **B29f** *1/12*; **B29h** *3/14*, *7/08*

U.S. Cl. 425—119 **5 Claims**



1. In apparatus for molding a two colored sole into a tasted upper;

a. a mold side ring for defining part of a mold cavity adapted to be closed at one end by a lasted upper;

b. a sole plate slidably disposed in said mold cavity in close confronting relation with said side ring means;

c. said sole plate having a surface for confronting said lasted upper and a side wall with a peripheral groove therewithin and a lip thereon between said lasted upper confronting surface and said groove, said lip extending toward and into close proximity with said side ring;

d. a first passage through said ring into said mold cavity for introducing rubber therewithin,

e. a second passage through said ring into said mold cavity for introducing gas at high velocity into said mold cavity;

f. a third passage through said ring into said mold cavity at a point remote from said second passage for venting said gas from said mold cavity, whereby said gas will travel across said mold cavity; and

g. means for moving said sole plate toward and away from said one end.

3,852,006

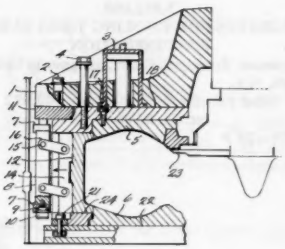
MOULD ASSEMBLY OF TIRE VULCANIZER

Nobuhiko Irie, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1973, Ser. No. 402,174

Int. Cl. B29h *5/02*

U.S. Cl. 425—47 **3 Claims**



1. A mould assembly of a tire vulcanizer, of the type having a stationary lower mould, an upper mould moved up and down by a bolster plate, and a plurality of tread moulds arranged around said lower mould and being movable radially of the lower mould, the radial movement of said tread moulds being caused by the vertical movement of said bolster plate, said mould assembly comprising means for vertically moving said bolster plate and said upper mould relative to each other, outer ring walls suspended from said bolster plate and arranged around said tread moulds, links pivotally connecting said outer ring walls with the tread moulds respectively, means for vertically adjusting the points where said links are pivotally connected with said outer ring walls, means provided on said bolster plate for parting said plate from the upper mould in contact with the lower mould and a member provided on the upper mould and having a horizontal guide surface for guiding each tread mould in the radial direction.

3,852,007

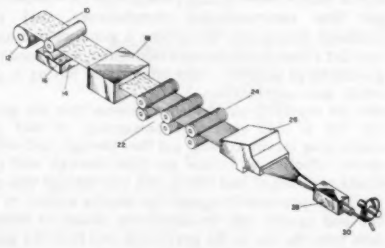
APPARATUS FOR MAKING FILTERS

William E. Levers, and Charles H. Keith, both of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 36,746, May 13, 1970, abandoned. This application Mar. 24, 1972, Ser. No. 237,904

Int. Cl. B29c *17/02*

U.S. Cl. 425—66 **7 Claims**



1. An apparatus for preparing improved cigarette filters comprising a supply means for providing a web of synthetic

thermoplastic organic fibers having at least one surface thereof impregnated with a film-forming derivative of cellulose which renders the web stiff, flexing and fracturing means for receiving, flexing and fracturing said film-forming derivative of cellulose on said web, patterning means for embossing said web, plasticizing means for applying a plasticizer to at least one surface of the flexed and embossed web, which plasticizer means softens the fractured web and means for converting the plasticized web into a substantially cylindrical tobacco smoke filter rod.

3,852,008

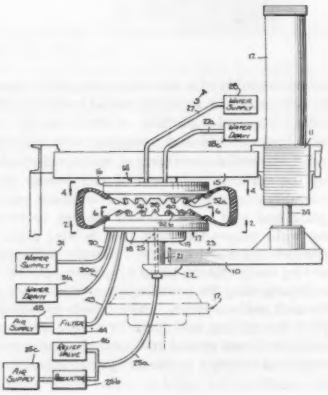
APPARATUS FOR COOLING TIRES DURING POST-INFLATION

Daniel Shichman, Trumbull, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed July 26, 1973, Ser. No. 382,972

Int. Cl. B29h *17/00*

U.S. Cl. 425—28 P **9 Claims**



1. Apparatus for post-mold cycle cooling a pneumatic tire, after the removal of the tire from the mold and during the course of a post-inflation treatment, comprising:

means for supporting a tire to be cooled;

means for inflating the tire;

means for cooling said tire-supporting means;

means for discharging gas into the inflated tire comprising a gas-intake passageway, a gas-discharge passageway, and orifice means between said passageways for establishing gas flow communication therebetween, said gas-discharge passageway comprising a gas-discharge aperture and a lateral wall between said orifice means and said gas-discharge aperture, said lateral wall having a gas-intake aperture therein;

means for supplying gas at higher pressure than the gas in the tire to said gas-intake passageway of said gas-discharging means to cause gas flow through said orifice means effective to induce gas flow through said gas-intake aperture of said lateral wall and through said gas-discharge passageway against the interior surface of the tire and against said tire-supporting means to transfer heat from the tire to the gas therein and from the gas to said tire-supporting means;

and means for preventing a pressure build-up above a predetermined value inside the tire.

3,852,009

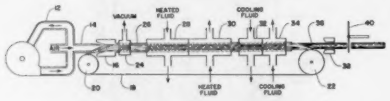
FILTER MAKING APPARATUS

John D. Roberts; John D. Ellenberg, and Charles H. Keith, all of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 224,224, Feb. 7, 1972, abandoned, which is a division of Ser. No. 775,390, Nov. 13, 1968, Pat. No. 3,656,484. This application Oct. 29, 1973, Ser. No. 410,857

Int. Cl. B29c *15/00;* **B32b** *5/08*

U.S. Cl. 425—83 **3 Claims**



1. An apparatus for forming a stable elongated element from short thermoplastic fibers containing a bonding constituent comprising a nonporous cylindrical tube of substantially constant cross sectional dimension, blowing means for conveying discrete short thermoplastic fibers having no dimension greater than the diameter of said tube containing a bonding constituent into said tube to form an element in which said short fibers are predominently transverse to the longitudinal axis of said element by formations within the nonporous tube, and means for heating said element to activatee said bonding constituent.

3,852,010

INJECTION MOLDING MACHINE WITH OPTIONAL PIVOTABLE SUPPORT FRAME

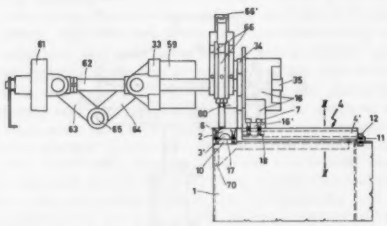
Karl Hehl. Siedlung 183, 7291 Lossburg/Wuerttemberg, Germany

Filed Nov. 15, 1972, Ser. No. 306,629

Claims priority, application Germany, Nov. 16, 1971, 2156818

Int. Cl. B29f *1/00*

U.S. Cl. 425—192 **10 Claims**



1. In an injection molding machine which includes a die closing unit and at least one injection unit on a machine base, a combination of mounting elements for mounting the die closing unit on the machine base in two different assembly configurations, the combination comprising:

a generally horizontal upper end wall and a generally vertical forward end wall as parts of the machine base;

a horizontal mounting face defined by the machine base in the area of its upper end wall bordering its forward edge above said forward end wall, the mounting face including two mounting emplacements at opposite sides of the machine base to which the die closing unit is directly attachable in a first, fixed assembly configuration; and

a pivotable support frame which is interposable between the die closing unit and the mounting face of the machine base in a second, pivotability-providing assembly configuration; and wherein

said support frame includes:

means for pivotably attaching the support frame to the mounting face at its mounting emplacement so as to permit pivoting of the support frame between a horizontal and a vertical position, said pivoting means including an inner pivot member journalled in the support member and adapted for attachment to the two mounting emplacements of the mounting face; and

two spaced, parallel rail profiles extending perpendicular to the pivot axis defined by said pivoting means and having generally flat upper mounting faces to which the die closing unit is attachable in said second assembly configuration.

3,852,011

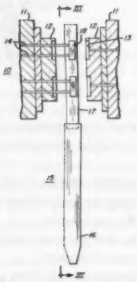
ORIENTED REMOVAL STRUCTURE FOR AN INJECTION MOLDING MACHINE

Humbert Luciano Maiocco, Woodlyn, Pa., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 25, 1972, Ser. No. 300,511

Int. Cl. B29c *7/00*

U.S. Cl. 425—242 R **1 Claim**



1. In an apparatus for injection molding thermoplastic products having at least two platens, at least one being movable, mold halves attached to said platens, a mold cavity formed by said mold halves, movable ejector pins extending partially into said cavity, and means for injecting plastic into said cavity, the improvement comprising a movable finished product receiving and orienting means disposed outside the platen area during the molding process and movable upon mold opening to a position between said spaced platens, closely spaced from and about the finished product, said receiving and orienting means being shaped to receive the product and place it in a predetermined orientation, and comprising a telescoping exit trough which is disposed below the mold portions during molding, and which telescopes upward into position about the ejector pin supported product when the mold is opened, said telescoping exit trough having a movable upper receiving portion having ejector pin receiving apertures therein and a stationary lower funneling portion through which the product exits.

3,852,012

CONTINUOUSLY OPERATING PANEL PRESS

Heinrich Pfeiffer, Berliner Ring, Germany, assignor to Maschinenfabrik J. Dieffenbacher & Co., Eppingen, Germany

Filed Aug. 28, 1973, Ser. No. 392,232

Claims priority, application Germany, Aug. 29, 1972, 2242492

Int. Cl. B29d *7/14*; **B29c** *15/00*

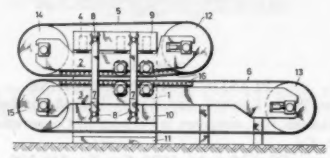
U.S. Cl. 425—363 **8 Claims**

1. A continuously operating press for the fabrication of panels of chips, fibers, plywood and the like, comprising in combination:

an open machine frame which includes a base portion, an upper support member and a lower support member, both arranged at a vertical distance from one another and from the base portion;

a movable press spar and a stationary press spar facing one another vertically on opposite sides of a horizontal work gap between the support members; one of the spars being mounted underneath the upper support member, the other one being mounted above the lower support member;

means for vertically adjusting the movable press spar; and an upper conveyor supported by the spar mounted on the upper support member, and a lower conveyor supported



by the spar mounted on the lower support member; and wherein:

each conveyor includes an endless conveying element, and conveyor drive means; and

the upper conveying element has an outer return strand running above the upper support member and an inner working strand forming the upper side of the work gap, while the lower conveying element has an outer return strand running below the lower support member and an inner working strand forming the lower side of the work gap, both endless conveying elements being removable from their guide drums by laterally sliding them over their respective support members and press spars.

3,852,013

EXTRUDER FOR PLASTICS MATERIAL, PARTICULARLY THERMOPLASTIC OR NON-CROSS-LINKED ELASTOMERIC MATERIALS

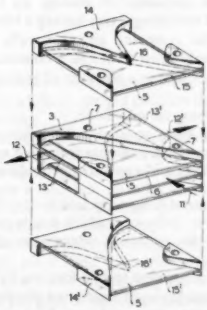
Hartmut Upmeier, zum kahlen Berg 11, 4542 Tecklenburg, Germany

Filed Sept. 19, 1973, Ser. No. 398,794

Claims priority, application Germany, Sept. 19, 1972, 2245820

Int. Cl. B29f *3/02*

U.S. Cl. 425—376 **2 Claims**



1. An extruder for plastics material, wherein a supply passage for the material is provided with a distributor for dividing

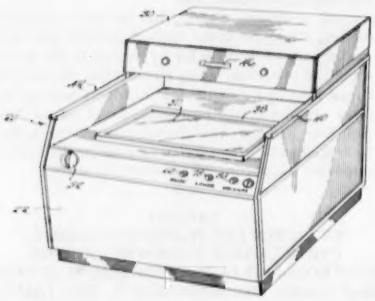
the flow of material into two or more branch passages leading to processing tools for the material, and the distributor comprises conduits corresponding in number to the number of branch passages, the inlets of said conduits being disposed in the supply passage and said conduits opening into a respective one of the branch passages, wherein further the conduits comprise a plurality of laminar channels which open on alternate sides into a respective one of the branch passages and the inlets of which extend over the entire cross-section of the supply passage, each outermost laminar channel being subdivided by means of a central blade so that one half opens into one of the part-passages and the other half opens into the other part-passage.

3,852,014

PLASTIC MOLDING MACHINE

Jerome Watis Kimball, and Kenny Harrell Kimball, both of Savannah, Ga., assignors to Permacraft Corporation, Savannah, Ga.

Filed Mar. 14, 1973, Ser. No. 341,239
Int. Cl. B29c *17/00*
U.S. Cl. 425—388 **37 Claims**



1. A vacuum molding apparatus comprising:

frame means for receiving and holding a plastic sheet,

heater means mounted for heating and softening said sheet,

a forming bed having a mold receiving surface for receiving a mold, and means defining a plurality of vertical and horizontal air channels for guiding air being removed from said bed including a tray having a bottom floor with an opening for removing air, side walls extending upwardly from said floor to define a continuous peripheral edge, said floor having a plurality of grooves for channelizing air flow,

a mesh screen lying on said floor,

a further board lying atop said mesh screen and having grooves on the surface remote from said screen for channelizing air flow, and apertures extending therethrough, and

a composition board lying atop said further board having a corduroy upper surface on which molds can be placed as desired with the corduroy ridges also channelizing air flow.

vacuum means connected to said forming bed for removing air from a space between a softened plastic sheet and said bed to cause said softened sheet to be drawn about a mold on said mold receiving surface, and

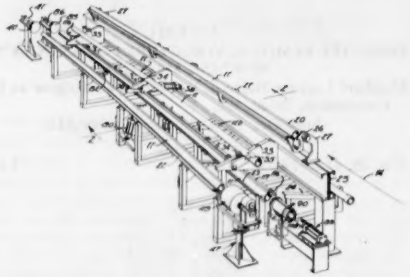
means for moving said frame means and a held sheet between a position adjacent said heater means for softening and a position engaging said forming bed for molding a softened sheet about a mold.

3,852,015

BELLING AND HANDLING APPARATUS FOR PLASTIC PIPE

Patrick H. Stansbury, Spokane, Wash., assignor to ASC Industries, Inc., Spokane, Wash.

Filed Mar. 12, 1973, Ser. No. 340,478
Int. Cl. B29c *17/02*
U.S. Cl. 425—392 **8 Claims**



1. A belling and handling apparatus for plastic pipe in preselected lengths of constant diameter along a straight pipe axis, comprising:

first pipe support means in the form of an upwardly open trough for receiving an individual pipe length and fixing the location of the pipe axis;

pipe delivery means for moving individual pipe lengths to said first pipe support means;

first pipe locating means at said first pipe support means for longitudinally shifting the position of each pipe along its axis while on said first pipe support means to thereby move the pipe to a preselected longitudinal location;

pipe heating means movably mounted at one end of said first pipe support means for movement with respect to said first pipe support means between a retracted position clear of pipe at said preselected longitudinal location and an extended position wherein one end of the pipe is received within the pipe heating means;

second pipe support means in the form of an upwardly open trough transversely and elevationally spaced below the elevation of the trough of said first pipe support means and parallel thereto, said second pipe support means being adapted to hold an individual pipe length;

pipe transfer means for moving individual pipe lengths from said first pipe support means to said second pipe support means by gravity;

second pipe locating means at said second pipe support means for longitudinally shifting each pipe length therein along its pipe axis to a preselected longitudinal location thereon;

pipe clamping means for fixing the location of each pipe at said last-mentioned preselected longitudinal location along the second pipe locating means;

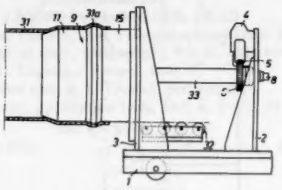
pipe belling means movably mounted at one end of said second pipe support means for movement with respect to said second pipe support means between a retracted position clear of pipe at said last-mentioned preselected longitudinal location on said second pipe support means and an extended position wherein the heated end of pipe held by said pipe clamping means is engaged by the pipe forming means to alter its circumferential configuration; and

pipe discharge means for removing each pipe length from said second pipe locating means.

3,852,016
RETRACTABLE MANDREL FOR BULGING OUT AND FORMING AN ANNULAR PERIPHERAL GROOVE IN PLASTIC TUBES

Robert Delauzun, Ecully, France, assignor to Societe Anonyme Seperef TMP Societe pour L'Equipement Des Reseaux En Comalisations De Matieres Plastiques, Quincieux, France

Filed Sept. 12, 1973, Ser. No. 396,570
Claims priority, application France, Sept. 15, 1972, 72.32850
Int. Cl. B29c *17/00*; B29d *23/00*
U.S. Cl. 425—393 5 Claims



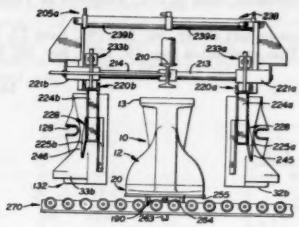
1. A retractable mandrel for bulging out and forming an annular peripheral groove in plastic tubes, comprising a shaft mounted on a carriage, said carriage being displaceable for translatory movement along the longitudinal axis of the shaft, the shaft having a cylindrical end piece with a frusto-conical tip adapted to be inserted in a plastic tube, a drum keyed to the shaft, the shaft passing through the bottom of the drum, four rim-forming sector members adapted to form a complete circular rim, said sector members being pivoted in pairs about a first pair of slidable pivot pins arranged diametrically opposite each other for sliding movement in radial slots in the bottom of the drum, a second pair of slidable pivot pins fixed to diametrically opposed extremities of two of the sector members and passing through parallel slots also in the bottom of the drum, said second pair of pivot pins being received in grooves, said grooves forming together an S with portions extending from the axis of the shaft in a drive disc mounted for rotation, said grooves cooperating with said parallel slots for effecting the outward or expansive movement of the sector members in order to form an annular peripheral groove in the tube in a first direction of rotation of the disc and for retracting or folding the sector members over one another to each side of the line drawn between the axes of said first pair of pivot pins.

3,852,017
APPARATUS FOR A SYSTEM TO EXTRICATE INTRICATE, CERAMIC SHAPES FROM MULTIPLE PIECE MOLDS

Fred L. Derror, Lucas, Ohio, assignor to Mansfield Sanitary, Inc., Perrysville, Ohio

Continuation of Ser. No. 139,622, May 3, 1971, abandoned, which is a division of Ser. No. 865,863, Oct. 13, 1969, Pat. No. 3,671,160. This application June 1, 1973, Ser. No. 366,199
Int. Cl. B28b *21/82*
U.S. Cl. 425—451 5 Claims

1. A system for extricating ceramic shapes from a multiple piece mold comprising; a cradle formed by opposed sections of a mold, a green casting supported by said cradle, a gripper means presenting a pair of tong means, each tong means selectively engaging one of the opposed mold sections forming the cradle, first means to effect actuation of each tong means in said pair between an open position in which each tong means may be moved into and out of engagement with the appropriate mold section of said cradle and a locked position in which each tong means grasps the appropriate mold section of said cradle, and second actuating means selectively to maintain said tong means in a first, juxtaposed position or a second, separated position and further selectively to move said tong means between said first and second positions while

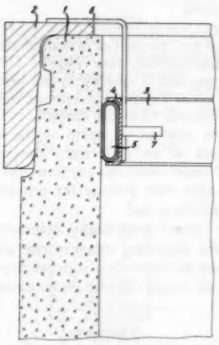


said tong means are disposed in the locked position, thereby separating the opposed mold sections of said cradle.

3,852,018
CONCRETE PIPE STABILIZING RING

Bent Melchior Karlsen Holme, Brondersiev, Denmark, assignor to Pedershaab Maskinfabrik A/S, Bondersiev, Denmark

Filed Jan. 31, 1973, Ser. No. 328,331
Claims priority, application Denmark, Feb. 9, 1972, 579/72
Int. Cl. F16m *13/00*
U.S. Cl. 425—472 3 Claims



1. Apparatus for stabilizing freshly cast pipe of concrete or similar material while in upright position during the hardening period, comprising:

a rigid outer cylindrical member having a regular inner surface in direct contact with the outer like regular surface of an upper portion of the pipe,

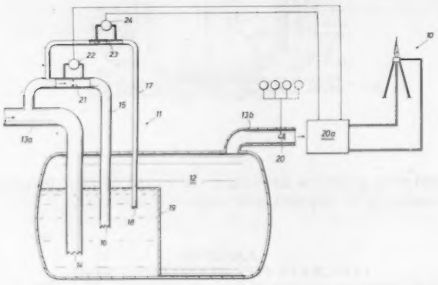
an inner rigid cylindrical member located within the pipe and of smaller diameter than the inner diameter of the pipe and concentric therewith,

and an inflatable ring member supported on the outer portion of the inner rigid cylindrical member and located between said inner cylindrical member and the inner surface of the pipe in opposed relation to the rigid outer cylindrical member for bearing against the inner pipe surface and the outer surface of the inner cylindrical member when inflated, for securing between them said upper portion of the pipe.

3,852,019
HIGH CAPACITY SMOKELESS FLARE HAVING A VERY LOW GAS FLOW DETECTOR

John Jacob Stranahan, Port Arthur, and John Carroll Lee Hollier, Nederland, both of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 266,795, June 27, 1974, abandoned. This application Dec. 19, 1973, Ser. No. 426,267
Int. Cl. F23n *1/00*
U.S. Cl. 431—4 **14 Claims**



1. A method for maintaining an aspirating steam nozzle gas flare smokeless wherein the gas is supplied to the flare from a large main gas line with a low flow rate which is immeasurable in the large main gas line, the immeasurable flow rate gas range comprising a slow flow rate portion of 1 percent to 3 percent of maximum design flow rate and a very slow flow rate portion of up to 1 percent maximum design flow rate, comprising the steps of,

a. detecting gas that is flowing at the slow flow rate portion of 1 percent to 3 percent of maximum design flow rate of the immeasurable flow rate range,

b. detecting gas that is flowing at the very slow flow rate portion of up to 1 percent maximum design flow rate of the immeasurable flow rate range,

c. varying the amount of steam to the aspirating steam nozzle equal to an empirically determined fixed set amount of steam when the gas flow rate is at least in the very slow flow rate portion for providing a smokeless air-to-gas mixture, and

d. adding a second empirically determined fixed set of steam to the aspirating steam nozzle when the gas flow rate reaches the slow flow rate portion for providing a smokeless air-to-gas mixture and for conserving steam.

3,852,020
METHOD FOR ADMIXING COMBUSTION AIR IN A BURNER

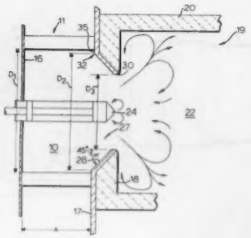
Charles F. Peczeli, and Edward T. Tyrcz, both of Mississauga, Ontario, Canada, assignors to Gulf Oil Canada Limited, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 264,635, June 20, 1972, abandoned. This application Feb. 22, 1974, Ser. No. 444,719
Int. Cl. F23m *3/00*
U.S. Cl. 431—9 **8 Claims**

1. A method for admixing combustion air and oil in substantially stoichiometric proportions for combustion at a predetermined rate related to a specific rating R in 10^6 Btu/hr., said specific rating R corresponding to combustion air being supplied at a pressure of about 6 inches water column and at about 80°F, said method comprising the steps:

passing said air tangentially through a plurality of overlapping vanes spaced around a hypothetical cylindrical surface coaxial with an oil atomizer and extending between first and second parallel walls perpendicular to the axis of said surface thereby to give the air an initial rotation, the diameter of said surface in inches being substantially equal to $4.23\ (R+1)^{1/2}$, the parallel walls being separated by a distance A in inches which is substantially equal to $2.69\ (R+1)^{1/2}$, the total minimum inlet area I between said vanes in square inches being substantially equal to $7.63\ R$,

passing said rotating air spirally inwardly from said surface to the outer circular limit of a substantially 45° frusto-conical nozzle in said first wall coaxial with said surface, said outer circular limit in inches being substantially equal to $4.03\ (R+1)^{1/2}$, the inner circular limit of the frusto-conical nozzle being substantially equal to $2.45\ R^{1/2}$,



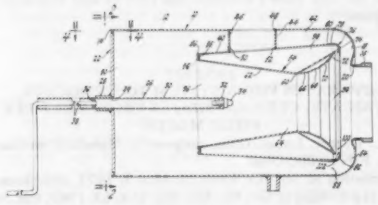
passing the spiralling air (a) radially inwardly adjacent said nozzle and (b) axially out through said nozzle into a substantially cylindrical combustion chamber coaxial with said nozzle and having a forward wall adjacent said nozzle and normal to the combustion chamber axis,

and atomizing the oil at the said predetermined rate in the said atomizer centered within said nozzle, thereby to mix said air and said atomized oil in said combustion chamber.

3,852,021
INTERNAL RECIRCULATION BURNER

Ronald E. Quinn, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1973, Ser. No. 412,661
Int. Cl. F23m *9/06*
U.S. Cl. 431—116 **5 Claims**



1. A combustor assembly comprising an outer casing having an inlet and an outlet therein, a combustion liner located within said outer casing and spaced with respect thereto to form an annular external recirculation passage therebetween, means including an inner deflection surface within said combustion chamber liner for forming a primary combustion zone therein having an inlet end and an outlet end, means forming a mixing chamber upstream of the inlet end of said primary combustion zone, means on the inlet end of said outer casing for producing a swirl pattern within said mixing chamber directed through said annular passage and said primary combustion zone to direct hot gases therefrom into said mixing chamber for prevaporization of air-fuel mixture therein,

means including said liner defining a plenum within said outer casing, means for directing primary air from exteriorly of said outer casing into said plenum, an annular nozzle lip supported on said liner in spaced relationship to said deflector plate to define an annular gap therebetween for passage of primary air from said plenum into said combustion zone for directing a quantity of primary air across the inner surface of said inner deflection surface to improve the recirculation flow of hot gases from said primary combustion zone into said mixing chamber thereby to reduce overall pressure drop from the inlet end to the outlet end of said outer casing.

3,852,022

LIQUID FUEL BURNER HEAD

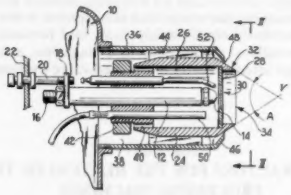
Renzo Medeot, Padova, and Francesco Cianfrone, Legnago, Verona, both of Italy, assignors to O.F.R. Officine Fratelli Riello S.p.A., Legnago, Verona, Italy

Filed Oct. 1, 1973, Ser. No. 402,374

Claims priority, application Italy, Oct. 6, 1972, 30178/72

Int. Cl. F23c *5/06*

U.S. Cl. 431—186 **8 Claims**



1. An improved liquid fuel burner head comprising coaxial components, a nozzle for delivering a jet of atomized fuel in a direction coincident with the axis of said components and means to deliver flows of comburent air all around said fuel jet, wherein coaxial chambers are formed within said components, to which pressure air is fed in an amount smaller than the stoichiometrically required amount, for the formation of primary air or initial combustion flow, and respectively in an amount at least complemental to attain said stoichiometric amount, for the formation of a secondary air flow adapted to complete the combustion, said chambers comprising systems of axial and respectively annular openings and passages coaxial with said component axis, said annular system delivering said secondary air flow comprising means for quidedly delivering pressure air in the form of a converging, essentially laminar flow that encompasses an inner space wherein an initial combustion with comburent air deficiency occurs, and surrounds an outer space wherein said combustion is completed and the burning mixture is diluted by circulating flows, as induced by the speed of said essentially laminar flow said outlet system from the inner chamber of said coaxial chambers comprising a central orifice in front of said nozzle, as well as essentially radially directed slits that are slanting in respect of a plane perpendicular to nozzle axis, in order to induce at least a part of the air flowing from said system to form a vortex that ensures the mixture of said air and atomized fuel to expand within a space as defined by said convergent laminar flow delivered from the outer chamber outlet systems.

3,852,023

APPARATUS DISPOSING WASTE GAS BY BURNING

Takusen Itoh; Kenji Onose; Takayoshi Ueda; Noboru Okigami, and Iwao Miyabayashi, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Dec. 27, 1972, Ser. No. 319,018

Int. Cl. F23d *13/20*

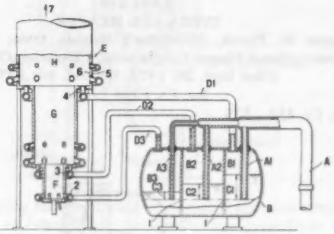
U.S. Cl. 431—202 **2 Claims**

1. An apparatus for disposing of combustible waste gas carried by a main pipe, comprising:

branch means connected to the main pipe for branching waste gas according to the flow rate in the main pipe;

a plurality of branch pipes connected to said branch means, waste gas being channelled into at least one of said branch pipes according to the flow rate in the main pipe;

a plurality of connecting pipes, one pipe communicating with each of said branch pipes for carrying waste gas therefrom, and each having a nozzle at the other end thereof; and



a combustion furnace connected to said connecting pipes, said combustion furnace being a continuous cylindrical body comprised of a plurality of stages arranged in vertical order and communicating with adjacent stages, the uppermost stage having a first diameter and the diameters of successively lower stages being successively smaller than the first diameter, gas injection nozzles provided adjacent the bottom of each stage, air suction ports provided adjacent each of said gas injection nozzles and an ignition means positioned within the lowermost stage.

3,852,024

IGNITION DEVICE FOR VAPORIZING BURNERS

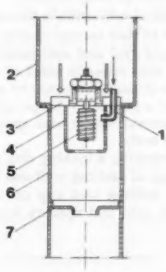
Hilding Ake Gerry Carlsson, Skallinge, Sweden, assignor to Monark-Crescent AB, Varberg, Sweden

Filed May 21, 1973, Ser. No. 361,964

Claims priority, application Sweden, June 14, 1972, 7785/72

Int. Cl. F23d *11/44*

U.S. Cl. 431—208 **2 Claims**



1. A liquid fuel burner device comprising a hollow vaporizing body means, a liquid fuel tube leading to and ending inside said hollow body, glow coil heat producing means inside said hollow body for both initial heating the end of said tube to a temperature which vaporizes the fuel in said tube and thereafter igniting inside said hollow body the vaporized fuel issuing from said tube, the end of said tube being juxtaposed to the internal surface of said hollow vaporizing body with a relationship such that surface tension spreads liquid fuel flowing out the end of said tube over the internal surface of the vaporizing body, a burning chamber means surrounding and communi-

cating with said vaporizing body for burning fuel vaporized inside said body while heating the outside of said body at least to a vaporizing temperature, and means for removing current from said glow coil after the initial ignition period, whereby said heat producing means may be initially activated to vaporize and ignite fuel in said tube and then deactivated after the ignited fuel has heated the vaporizing body to a point where liquid fuel in said tube is vaporized when the surface tension spreads it over the inside of said body.

3,852,025

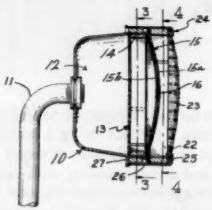
INFRA-RED HEATER

Eugene W. Placek, Middleburg Heights, Ohio, assignor to International Magna Corporation, Cleveland, Ohio

Filed Sept. 28, 1973, Ser. No. 401,837

Int. Cl. F23d *13/14*

U.S. Cl. 431—329 **9 Claims**



1. A gas-fired infra-red heat generator comprising, in combination,

an open-ended, cup-shaped body defining a plenum,

a combustible fuel mixture inlet into said plenum,

a perforated diffuser extending across said body and defining the front margin of said plenum,

a first spacer fitting within the open end of said body for holding said diffuser in position,

a primary screen having interwoven metal elements, said primary screen extending across the open end of said body and having a size slightly larger than and extending outwardly beyond the end of said body, said primary screen being crowned convex in its central area,

a second spacer having an inner diameter substantially equal to the open end of said body and positioned against the margin of said primary screen,

a reverberator grid of substantially the same diameter as the outer diameter of said second spacer,

the margins of said grid and said primary screen being in direct contact with opposite sides of said second spacer, a cap having an inwardly directed lip engaging the margin of said grid and a perimeter flange extending around and beyond said second spacer and spaced from the outer surface of said body,

and a means comprising a locking ring positioned between the inner surface of said cap wall and the outer surface of said body for holding said cap on said body and said diffuser screen, grid and spacers in assembled relationship.

3,852,026

METHOD OF HEATING GOODS AND A HEATING FURNACE

Folke Johansson, Vasteras, Sweden, assignor to Granges Engineering Aktiebolag, Vasteras, Sweden

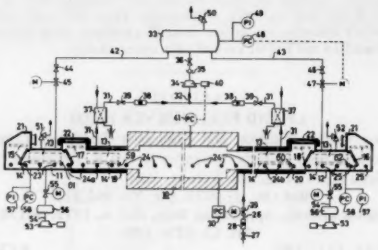
Filed Nov. 1, 1973, Ser. No. 411,813

Claims priority, application Sweden, Nov. 6, 1972, 14354/72

Int. Cl. F27b *11/06*

U.S. Cl. 432—23 **6 Claims**

1. A method for the heating of material in a furnace of the type which is heated without combusting fuel in the furnace space itself and having at least one gas-flushed lock-type feed valve for charging and discharging the furnace, which material tends to react chemically with the surrounding atmosphere when subjected to heat, said method comprising maintaining in the furnace a controlled atmosphere suitable for the material being treated by supplying at least substantially constantly thereto a gas having a controlled composition, passing the gas



used for maintaining the controlled atmosphere in the furnace at least substantially continuously from said furnace, storing said gas externally of the furnace in a magazine, and passing such stored gas intermittently to the feed valve for flushing the same.

3,852,027

FUME EXTRACTORS FOR THE HEATERS OF TEXTILE PROCESSING MACHINES

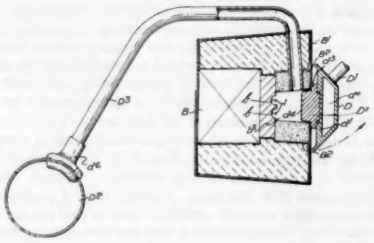
Frederick Hugh Howorth, Chorley, England, assignor to Howorth Air Conditioning Limited, Farnworth, Bolton, England

Filed Nov. 28, 1973, Ser. No. 419,520

Claims priority, application Great Britain, Dec. 8, 1972, 56765/72

Int. Cl. F27b *9/28*

U.S. Cl. 432—59 **1 Claim**



1. A fume extractor unit for a heater assembly of a textile yarn or filament processing machine comprising a heater, a container surrounding said heater closed at each end, heat insulation material lining said container. amd means defining a treatment chamber within the container through which the yarn or filament is passed for heat treatment by said heater, said chamber having at one side an opening and a normally closed insulated door over said opening, characterized by an exhaust conduit open at one end directly into said chamber and passing through said container insulation in spaced relation to said door opening for connection to an external suction duct, whereby fumes in the chamber resulting from heat treatment of the yarn or filament are directly exhausted from the chamber during processing.

3,852,028

APPARATUS FOR PREHEATING SCRAP

Richard J. Reinbold, Allentown; Eugene M. Rudzki, Bethlehem, and Bradford K. Pease, Allentown, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 238,870, March 28, 1972, Pat. No. 3,802,830. This application Oct. 23, 1973, Ser. No. 408,347

Int. Cl. F27b *1/08*

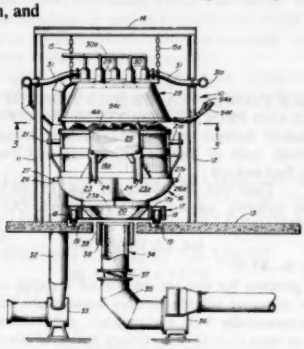
U.S. Cl. 432—162 7 Claims

1. Apparatus for preheating scrap in a preheater station prior to charging said scrap into a furnace, comprising:

a. containing means adapted to hold said scrap,

b. heating means adapted to fit atop said containing means to provide hot combustion gases to heat said scrap, said heating means being a burner hood comprising a steel shell in the shape of a frustrum of a cone, having a broad bottom base and a narrow upper base, a box-like water-cooled steel ring having a water inlet pipe and a water outlet pipe and a baffle plate therebetween to direct the flow of water around said box-like steel ring attached to the broad bottom base and a steel plate attached to the narrow upper base, a refractory lining on the inside surface of the steel shell and a plurality of downwardly directed burners mounted on said narrow upper base,

c. supporting means to hold said containing means and adapted to allow hot combustion gases to pass therethrough, and



d. exhausting means adapted to be mated with said support means to exhaust said hot combustion gases from said containing means.

CHEMICAL

3,852,029
STABLE CONCENTRATED SOLUTIONS OF DIRECT DYES AND PROCESS FOR THEIR MANUFACTURE

Hans Rudolf Bolliger, Mere, and Herbert Alexander Potts, Bramhall, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 20, 1971, Ser. No. 191,065

Claims priority, application Switzerland, Oct. 22, 1970, 15607/70

Int. Cl. D06p *1/06*

U.S. Cl. 8—41 R **21 Claims**

1. A process for the production of a stable concentrated solution of water soluble tertiary ammonium salts of direct dyes, substantially free of inorganic salts which comprises adding at least 2 mols of a tertiary amine of the formula

wherein R_1, R_2 and R_3 independently of each other denote methyl, ethyl, methoxyethyl or hydroxyethyl or wherein R_2 and R_3 together with the nitrogen atom to which they are attached form a pyrrolidine, piperidine, morpholine or thiomorpholine ring

to an aqueous medium containing

A. one mole of a member of the group consisting of (1) a tertiary ammonium salt of an azo sulphonic acid or carboxylic acid compound containing at least one primary or secondary amino group, and (2) a tertiary ammonium salt of a colored anthraquinone sulphonic acid or carboxylic acid compound containing at least one primary or secondary amino group, and (B) one mole of a member of the group consisting of (1) a tertiary ammonium salt of an azo sulphonic acid or carboxylic acid compound containing at least one primary or secondary amino group, and (2) a tertiary ammonium salt of a colored anthraquinone sulphonic acid or carboxylic acid compound containing at least one primary or secondary amino group, to form the tertiary ammonium salts of the said compounds, subsequently adding one mole of phosgene to the said aqueous medium to form the condensation product of the salts of said compounds with phosgene, the condensation reaction being conducted in the presence or absence of further auxiliary products.

3,852,030
SURFACTANT FOR ELECTROLYTE-CONTAINING PROCESSING SOLUTIONS

Joseph A. Komor, Allentown, Pa., assignor to GAF Corporation, New York, N.Y.

Division of Ser. No. 21,197, March 19, 1970, Pat. No. 3,704,262. This application Aug. 28, 1972, Ser. No. 284,250

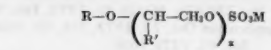
Int. Cl. B01f *17/02, 17/14;* **D06l** *3/06*

U.S. Cl. 8—111 **5 Claims**

1. A textile wet-processing bath of improved detergency comprising an aqueous solution containing the functional bath agents; up to 10% of electrolytes; and up to 1% by weight of said bath of a detergent blend of surfactants consisting essentially of

a. 30 to 90 parts by weight of phosphate ester reaction products of phosphorating agents and eight-carbon alcohols, and;

b. 70 to 10 parts by weight of a compound of the formula:



where R is an alkyl radical containing 9 to 16-carbon atoms or an alkylphenyl grouping in which the alkyl substituents contain a total of 6 to 12-carbon atoms; R′ is H or a mixture of H and CH_3 wherein the alkyloxylate mixture exhibits hydrophilic properties; x is a number corresponding to 10% to 70% alkoxylate by weight of the nonionic intermediate; and M is a water-solubilizing cation.

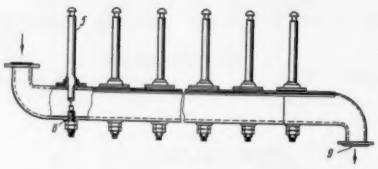
3,852,031
METHOD OF WET CLEANING OF MATERIAL FIBERS FROM IMPURITIES AND WOOD SWEAT

Valery Fedorovich Brodov, ulitsa Mashi Poryvaevoi, 6, kv. 5; Vyacheslav Stepanovich Osipov, ulitsa B. Filevskaya, 23, korpus 3, kv. 18; Mikhail Dmitrievich Zhdanov, Zhigulevskaya ulitsa, 19, korpus 1, kv. 69; Anatoly Anatolievich Burov, ulitsa Tsiolkovskogo, 6, kv. 11; Fedor Lukich Kovalev, ulitsa Alabyana, 10, korpus 6, kv. 159; Anatoly Illarionovich But, B. Akademicheskaya ulitsa, 75, korpus 2, kv. 24; Vadim Georgievich Ivanov, Erevanskaya ulitsa, 17, korpus 1, kv. 39; Nikolai Nikolaevich Belyaev, 3 Pryadilnaya ulitsa, 2, korpus 4, kv. 31, all of Moscow, and Lev Alexandrovich Bashev, ulitsa Tereshkovoi, 2, kv. 51, Mytischi Moskovskoi oblasti, all of U.S.S.R.

Filed Apr. 6, 1973, Ser. No. 348,628

Int. Cl. D01c *1/00*

U.S. Cl. 8—139 **4 Claims**



1. A method of wet cleaning natural fibres from impurities and wool sweat comprising forming a mixture of said fibres with a washing solution, positioning said mixture between electrodes installed in opposition to each other within a vessel, supplying a voltage to said electrodes within a range of from 20 to 70 kilovolts, and producing a pulse discharge with an energy of from 0.1 to 12 kilojoules between said electrodes, thereby generating a shock hydraulic wave within said mixture for breaking up the impurities and removing the same from said fibres as well as emulsifying the wool sweat and removing it from said fibres.

3,852,032
PROCESS FOR STERILIZING HYDROPHILIC GELATIN LENSES HAVING ULTRAVIOLET STABILIZERS

Jacques Urbach, North Hollywood, Calif., assignor to Uroptics International Incorporated, Los Angeles, Calif.

Division of Ser. No. 150,358, June 7, 1971, abandoned. This application May 7, 1973, Ser. No. 358,058

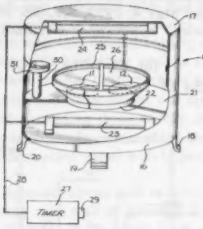
Int. Cl. A61l *1/00;* **G02c** *13/00*

U.S. Cl. 21—54 R **4 Claims**

1. A process for the control of bacterial and other organic growth on soft contact lenses formed of hydrophilic gel material, comprising:

combining an ultraviolet stabilizer with the hydrophilic gel material, of said contact lens, and

periodically exposing said lens to ultraviolet radiation of



sufficient intensity and duration to kill or retard said bacterial and other organic growth, the presence of said ultraviolet stabilizer preventing degradation of said lens as a result of said exposure.

3,852,033

PROCESS FOR CONTROLLING CHLORATE AND HYDROGEN ION CONTENT IN THE MANUFACTURE OF CHLORINE DIOXIDE FROM ALKALI METAL CHLORATE AND AN INORGANIC ACID

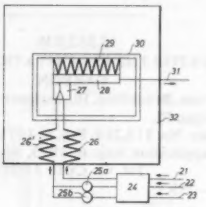
Bengt Goran Hultman, Domsjoverken, Sweden, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed July 9, 1973, Ser. No. 377,857

Claims priority, application Sweden, July 14, 1972, 9343/73

Int. Cl. G01n *25/20;* **C01b** *11/02*

U.S. Cl. 23—230 A **24 Claims**



1. A process for measuring the chlorate ion and the hydrogen ion concentration of chlorine dioxide-producing reaction mixtures comprising alkali metal chlorate, reducing agent, and inorganic acid by a calorimetric determination, which comprises withdrawing a sample of the reaction mixture, combining it with a chlorate ion reagent which reacts with chlorate ions with liberation of heat, measuring the heat liberated, and from this heat determining the concentration of chlorate ion, withdrawing another sample of the reaction mixture, combining it with a hydrogen ion reagent which reacts with hydrogen ions with liberation of heat, measuring heat liberated and from this heat determining the concentration of hydrogen ion.

3,852,034

INDICATOR FOR EFFECTIVENESS OF ETHYLENE OXIDE STERILIZATION

Donald A. Gunther, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed June 21, 1972, Ser. No. 264,746

Int. Cl. G01n *21/06*

U.S. Cl. 23—232 R **7 Claims**

1. Chemical indicator for use in an ethylene oxide sterilizer to signal whether or not sterilizing has been effective comprising

carrier means;

amino substituted indicating compound which contains hydrogen attached to amino nitrogen and which undergoes color change when hydrogen attached to amino nitrogen is replaced by hydroxyethyl,

buffering agent selected to provide amino group dissociation equilibrium such that readily visible color change indicates sterilizing effectiveness.

3,852,035

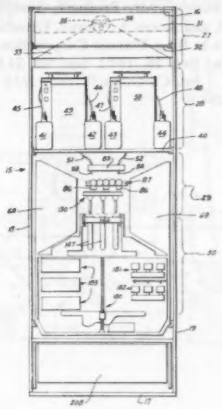
AUTOMATED HANDLING AND TREATING APPARATUS

Orville Tungstall Wood, 9828 N. 105th Dr., Sun City, Ariz. 85351, and Harold Wood, Suite K, 2909 Hillcroft, Houston, Tex. 77027

Filed June 1, 1972, Ser. No. 258,517

Int. Cl. G01n *31/00*

U.S. Cl. 23—253 R **9 Claims**



1. An apparatus for automatically handling and treating a plurality of discrete samples to perform preselected operations thereon, comprising:

a plurality of containers, each of which contains one of said samples;

means for holding stationary said containers, said container holding means having a particular location therein for each of said containers, said locations being positioned in a desired arrangement;

means for sensing which locations in said container holding means have containers held therein;

a plurality of first means for storing reagents used for relatively permanent storage of said reagents;

a plurality of second means for storing reagents used for temporary storage of said reagents, the number and arrangement of said plurality of second storage means corresponding to the number and arrangement of said locations in said container holding means;

means for transferring a preselected quantity of the reagents stored in at least one of said first storage means into at least one of said second storage means to form a desired dosage in at least one of said second storage means,

said reagent transferring means transferring reagents into and forming a dosage only in the one or ones of the second storage means associated with said locations in said container holding means having containers held therein;

means for transferring simultaneously from each of said second storage means said dosages temporarily stored therein to said containers held in said container holding means;

a plurality of means for performing desired operations on said plurality of samples, each of said performing means being movable with respect to said sample containers held in said container holding means;

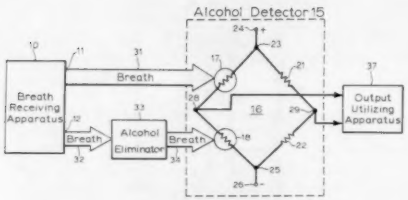
means for selectively transporting each of said performing means into a desired operational relationship with said stationary sample containers and for maintaining said peforming means in said relationship so that each of said performing means may perform its particular operation; and

means for controlling the operation of said first and second storage means, said reagent transfer means, said dosage transfer means, each of said performing means and said transporting means according to a preselected set of instructions.

3,852,036
BREATH TESTING SYSTEM

James E. Burroughs, Mt. Prospect; Joseph P. Hoppesch, Streamwood, and James A. Nowak, Glendale Heights, all of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 28, 1971, Ser. No. 213,141
Int. Cl. G01n *31/10, 31/12*
U.S. Cl. 23—254 E **1 Claim**



1. A breath testing system for determining breath alcohol concentration, comprising:

breath receiving apparatus for providing first and second substantially identical samples of deep lung breath received from a person whose breath includes alcohol, water and carbon dioxide;

an alcohol detector including a normally-balanced, four-legged wheatstone bridge having first and second substantially identical catalyst resistance elements in respective ones of two adjacent legs of the wheatstone bridge and a pair of equal resistors in respective ones of the other two adjacent legs of the bridge;

an alcohol removal stage including a heated platinum wire;

means for supplying said first breath sample directly to said first catalyst resistance element;

means for supplying said second breath sample through said alcohol removal stage to eliminate the alcohol content from said second sample and for then supplying the alcohol-free second sample to said second catalyst resistance element,

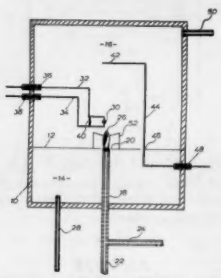
said first catalyst resistance element responding to the presence of alcohol in said first sample to effect unbalancing of said wheatstone bridge, an output information signal being produced by said bridge having an amplitude directly proportional to and representing the alcohol concentration of said first sample, any effect on said first catalyst resistance element from the water and carbon dioxide in said first sample being balanced by a similar effect on said second catalyst resistance element from the water and carbon dioxide in said second sample,

and a meter controlled by and responsive to the amplitude of said information signal to provide a visual display of the alcohol level in the breath under test.

3,852,037
SELECTIVE IONIZATION DETECTOR

Bruno Kolb, Owingen, and Joachim Bischoff, Uberlingen, both of Germany, assignors to Bodenseewerk Perkin-Elmer & Co. GmbH., Uberlingen/Bodensee, Germany

Filed May 4, 1973, Ser. No. 357,496
Claims priority, application Germany, May 6, 1972, 2222396
Int. Cl. G01n *31/12*
U.S. Cl. 23—254 EF **8 Claims**

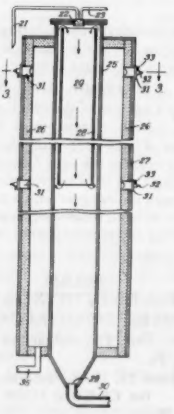


1. A selective ionization detector of the type for detecting halogen, phosphorus and nitrogen compounds, comprising a diode through which a sample gas under analysis is fed by means of a transfer gas, and an electrode including an alkali source in the form of a heated alkali-containing glass, so that the electrode exhibits an increased ion emission upon occurrence of such specific substances, the improvement in which: said alkali source comprises alkali glass maintained in a heated softened state during operation of the detector.

3,852,038
APPARATUS FOR THE REACTIVATION OF POWDERED CARBON

Floyd L. Corson, Brookfield, Ill., assignor to CPC International Inc., Chicago, Ill.

Division of Ser. No. 113,214, Feb. 8, 1971, Pat. No. 3,816,338. This application Aug. 6, 1973, Ser. No. 385,755
Int. Cl. C01b *31/08*
U.S. Cl. 23—259.9 **5 Claims**



1. Apparatus for the reactivation of spent powdered carbon having organic matter adsorbed thereon, comprising:

an elongate, generally tubular reactor vessel having a wall and a bore, and an inlet at one of its ends and an outlet at the opposite end, and means generally sealing each of its ends to provide, with said wall, an enclosed reaction chamber in the bore of said vessel;

means communicating with said inlet end for supplying to said reaction chamber an aqueous slurry of spent carbon; means for atomizing said aqueous slurry of spent carbon communicating with said inlet end; a convection tube coaxially disposed within said reaction chamber with its upper end positioned adjacent to but spaced from said outlet end and extending downwardly therefrom a distance no greater than about one-third the length of and spaced from said reactor vessel wall to provide an annulus thereabout;

heating means disposed about said reactor vessel wall for radiantly heating said wall to provide a temeprature in said reaction chamber in the range from about 1200°F to about 1900°F; a refractory shell which forms a furnace wall coaxially disposed outside said reactor vessel; and

means communicating with the outlet end of said reactor vessel for removing processed carbon from the reaction chamber.

3,852,039

FURNACE FOR THE COMBUSTION OF WASTE LIQUORS OR OTHER SOLUTIONS OR SUSPENSIONS CONTAINING COMBUSTIBLE ORGANIC SUBSTANCE AND VARIOUS COMBINATIONS WITH ALKALI

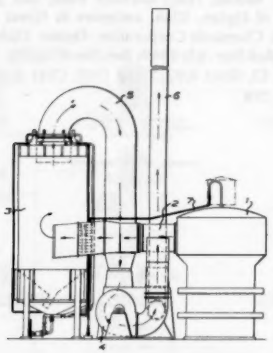
Sven Rudolf Gunnar Hasselberg, Broby, Sweden, assignor to Broby Industrier AB, Broby, Sweden

Division of Ser. No. 60,532, Aug. 3, 1970, abandoned. This application Feb. 8, 1973, Ser. No. 330,508

Claims priority, application Sweden, Aug. 4, 1969, 10863/69

Int. Cl. C10b *1/00*

U.S. Cl. 23—277 R **4 Claims**



1. In a furnace having a substantially circular cross section and a vertical axis for the continuous combustion of waste liquors containing combustible organic substances combined with alkali and having means for spraying said waste liquors into the top of the furnace, in the upper part of which moisture is evaporated from the waste liquor to concentrate the liquor and in the lower part of which the concentrated liquor is subject to combustion, the gaseous products of combustion rising in said furnace to effect the evaporation of moisture from the waste liquors being sprayed thereinto, the improvement comprising a circular furnace wall means extending circumferentially around the outside of the top of said furnace wall for forming therewith an annular collecting channel, a vault means mounted over the top of the furnace and supported circumferentially on the outer circumference of said annular channel means, said vault means being spaced from the upper end of said furnace wall to provide an annular, tapered gap therebetween, and an outlet means communicating with said annular channel means for removal therefrom of combustion products and evaporated moisture, the annular, tapered gap being widest at that point diametrically opposite said outlet means and being narrowest at the point adjacent said outlet means, whereby the combustion products and evaporated moisture will flow upwardly in the furnace substantially uniformly, through the annular tapered gap into said annular channel means and finally through said outlet means.

3,852,040

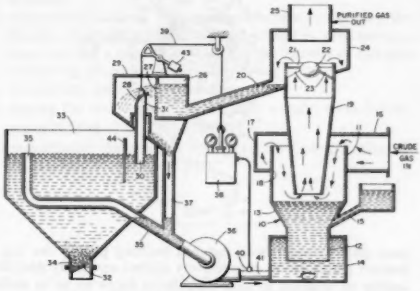
APPARATUS FOR REMOVING UNDESIRABLE SUBSTANCES FROM FLUE GAS OR THE LIKE

Karl Axel Goran Gustavsson, Enkoping, Sweden, assignor to Aktiebolaget Bahco Ventilation, Enkoping, Sweden

Filed May 30, 1972, Ser. No. 257,889The portion of the term of this patent subsequent to May 8, 1990, has been disclaimed.

Int. Cl. B01d *47/02;* **B01j** *1/00*

U.S. Cl. 23—284 **2 Claims**



1. An apparatus for removing pollutants from a gas comprising tank means for a treatment liquid, means for flowing the gas substantially perpendicularly against the surface of the treatment liquid and entraining liquid in the gas, means for flowing the gas upwardly and for reducing its velocity, means for separating liquid and solids carried thereby from the gas, means for flowing the resulting slurry as a stream, and means for dividing the said stream into two sub-streams comprising a conduit for intercepting less than all of the said stream and for carrying the resulting intercepted sub-stream to a settling tank, means for carrying the remaining sub-stream to a means for pumping supernatant liquid from the said settling tank and the said remaining sub-stream to the treatment tank, and means responsive to the pump pressure for positioning the said intercepting conduit with respect to the said means for flowing the slurry as a stream thereby determining the volumes of the said sub-streams.

3,852,041

LOW PROFILE CATALYTIC CONVERTER

Albert J. Moore; James A. Haggart, Jr., both of Davison, and Michael R. Foster, Goodrich, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

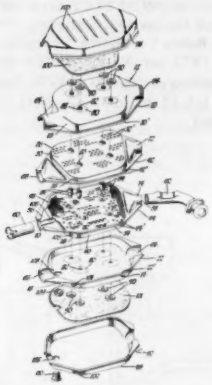
Continuation-in-part of Ser. No. 211,306, Dec. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 177,947, Sept. 7, 1971, abandoned. This application June 14, 1972, Ser. No. 262,708

Int. Cl. F01n *3/14*

U.S. Cl. 23—288 F **8 Claims**

1. A catalytic converter for automobile use, comprising in combination: a top housing plate, a bottom housing plate, and a pair of catalyst retaining plates sandwiched therebetween,

said four plates having mating peripheral faces coterminous over substantially their entire peripheries as seen in plan view so as to form a four-layer sandwich suitable for edge-sealing, said four plates further having like-positioned concave substantially semi-cylindrical peripherally spaced portions defining in combination cylindrical contours adapted to receive engine exhaust inlet and outlet pipes, respectively, said portions being both concave downwardly in the top plate, both concave upwardly in the bottom plate, concave downwardly on both of the catalyst retaining plates at one cylindrical contour, and concave upwardly on both catalyst retaining plates at the other cylindrical contour, whereby exhaust gas passing from the exhaust inlet pipe to the exhaust outlet pipe



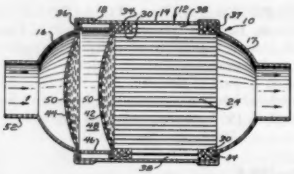
must pass through both catalyst holding plates, the top and bottom plates being respectively dished upwardly and downwardly in relation to said peripheral faces so as to define a space for exhaust gas flow from the exhaust inlet pipe to the exhaust outlet pipe, and the catalyst retaining plates being respectively dished upwardly and downwardly inboard of said peripheral faces and at varying distances in relation to said peripheral faces so as to define a catalyst containing space of substantially uniform depth disposed in a general slanting orientation between the exhaust inlet and the exhaust outlet, said catalyst retaining plates further having openings adapted to pass the exhaust gases while retaining catalyst material disposed in said space.

3,852,042

CATALYTIC CONVERTER WITH EXHAUST GAS MODULATING CHAMBER FOR PREVENTING DAMAGE TO CATALYST SUBSTRATE

Melvin H. Wagner, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 29, 1973, Ser. No. 327,367
Int. Cl. F01n *3/14*; B01j *9/04*
U.S. Cl. 23—288 F **10 Claims**



1. In a catalytic converter for treating exhaust gases from an internal combustion engine and having a metal housing including inlet and outlet means including fittings adapted to receive an exhaust conduit and an axially porous, catalyst coated ceramic element therein, the improvement comprising at least one transversely positioned perforated metal inlet screen positioned intermediate said inlet fitting and said ceramic element, elongated spacer means longitudinally movably positioned intermediate said inlet fitting and said ceramic element, for spacing said ceramic element from said inlet means, said spacer means having a higher temperature coefficient of expansion than said metal housing and said housing having a higher temperature coefficient of expansion than said ceramic element, said spacer means and said housing constituting a thermal effect compensating means arranged and constructed so that the relative shrinkage of said ceramic element relative to said housing during heating will be at least partially offset by the relative expansion of said spacer means relative to said housing.

3,852,043

STABILIZATION OF ALUMINUM HYDRIDE

Norman E. Matzek, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 15, 1966, Ser. No. 602,455
Int. Cl. B01j *1/00*
U.S. Cl. 23—293 **5 Claims**

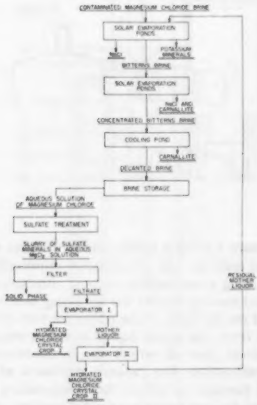
1. A process for increasing the thermostability of a crystalline, substantially non-ether solvated aluminum hydride which comprises placing a crystalline, substantially non-ether solvated aluminum hydride in a substantially inert atmosphere and maintaining said aluminum hydride in the presence of said atmosphere at a maximum temperature of about 0° C. for a period of at least about 4 months.

3,852,044

RECOVERY OF SUBSTANTIALLY POTASSIUM-FREE HYDRATED MAGNESIUM CHLORIDE FROM CONTAMINATED AQUEOUS SOLUTIONS

Ulrich E. G. Neitzel; Hans Gerhard Flint, and Jerome A. Lukes, all of Ogden, Utah, assignors to Great Salt Lake Minerals & Chemicals Corporation, Ogden, Utah

Filed Nov. 13, 1969, Ser. No. 876,306
Int. Cl. B01d *9/02*; C01d *1/30*; C01f *5/26*
U.S. Cl. 23—298 **8 Claims**



1. A process for the production of magnesium chloride from aqueous solutions containing magnesium, chloride, sulfate, sodium, and potassium ions in proportions such that simple evaporation of the solution would produce a crystal crop of

hydrated magnesium chloride contaminated with unacceptable amounts of potassium, which comprises:

concentrating said aqueous solution with respect to magnesium chloride sufficiently to depress the solubility of potassium and sodium salts in said solution thereby to effect the removal of such salts from solution so that the combined concentration of sodium and potassium remaining in said solution is less than about 3 moles per 1,000 moles of water;

cooling said solution sufficiently to further depress the solubility of potassium thereby to effect the removal of potassium from solution so that the concentration of potassium in solution is reduced to a level below about 1 mole per 1,000 moles water;

recovering the solution substantially free from solid sodium and potassium salts;

treating the solution as required to establish the concentration of sulfate therein below about 4 moles per 1,000 moles water without substantially increasing the concentration of sodium or potassium therein;

evaporating the solution to cause the hydrated magnesium chloride to crystallize therefrom, thereby forming a slurry of hydrated magnesium chloride, and holding said slurry at a temperature at which, upon further evaporation, the aqueous phase will become saturated with sodium salts before it becomes saturated with potassium salts; and

recovering the hydrated magnesium chloride from said slurry while the aqueous phase thereof is unsaturated with respect to sodium chloride.

3,852,045

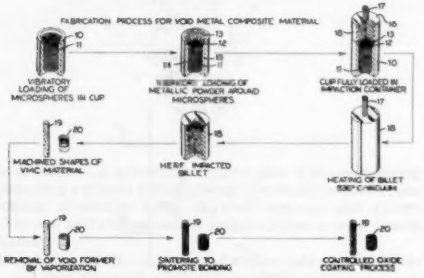
VOID METAL COMPOSITE MATERIAL AND METHOD

Kenneth R. Wheeler, Richland; Kenneth R. Sump, Kennewick, and Manuel T. Karagianes, Richland, all of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Aug. 14, 1972, Ser. No. 280,266

Int. Cl. C22c *1/08, 1/04;* **B22f** *3/16;* **A61c** *13/30;* **A61f** *1/24*

U.S. Cl. 29—182 **11 Claims**


FABRICATION PROCESS FOR VOID METAL COMPOSITE MATERIAL
VIBRATORY LOADING OF MICROSPHERES IN CUP
VIBRATORY LOADING OF METALLIC POWDER AROUND MICROSPHERES
CUP FULLY LOADED IN IMPACTION CONTAINER
MACHINED SHAPES OF VMC MATERIAL
HERF IMPACTED BILLET
HEATING OF BILLET
REMOVAL OF VOID FORMER BY VAPORIZATION
SINTERING TO PROMOTE BONDING
CONTROLLED OXIDE COATING PROCESS

1. A method of making a porous matrix structure having voids therein for tissue ingrowth applications, comprising:

arranging a plurality of elements of an expendable void former of a solid substance within a form cavity, the elements being arranged within the form cavity in a pattern corresponding to the size, shape and spatial pattern of the voids desired in the final matrix;

packing a fine powder of biocompatible metallic particles into the form cavity about the elements of the expendable void former to complete filling of the form cavity with a composite material comprising the expendable void former and metallic particles;

subjecting the composite material to a high energy rate forming process to cause the density of the resulting densified composite material to approach its theoretical density and form a densified matrix of metallic particles having initial bonds between the metallic particles;

removing the expendable void former without disruption of the densified matrix of metallic particles;

and subsequently sintering the matrix of metallic particles so as to cause the metallic particles to further bond and thereby form a solid metal matrix about the voids left by removal of the expendable void former.

3,852,046

METHOD FOR RECYCLING WASTE PLASTICS AND PRODUCTS THEREOF

Henry J. Brown, 421 Margo Ave., Long Beach, Calif. 90814

Division of Ser. No. 191,901, Oct. 22, 1971, abandoned. This application Jan. 3, 1973, Ser. No. 320,694

Int. Cl. C10l *5/14, 5/00, 5/40*

U.S. Cl. 44—1 R **2 Claims**

1. A method of disposing of mixed waste thermoplastic materials comprising halogen containing plastics and non-halogen containing plastics comprising the steps:

a. grinding the materials to form a particulate thermoplastic mixture;

b. separating low and high density plastics by floating the mixture through a liquid holding chamber containing a liquid having a density of less than the density of halogen containing plastics;

c. recovering the floating particles;

d. mixing the recovered particles with a slurry of cellulosic material; and

e. compressing the mixture of step (d) to form a combustible product.

3,852,047

MANUFACTURE OF PETROLEUM COKE

Warren G. Schlinger, Pasadena, Calif.; Harold C. Kaufman, and Carroll L. Crawley, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y., by said Schlinger and Kaufman

Division of Ser. No. 831,548, June 9, 1969, Pat. No. 3,673,080. This application Feb. 23, 1972, Ser. No. 228,587The portion of the term of this patent subsequent to June 27, 1989, has been disclaimed.

Int. Cl. C10l *5/00*

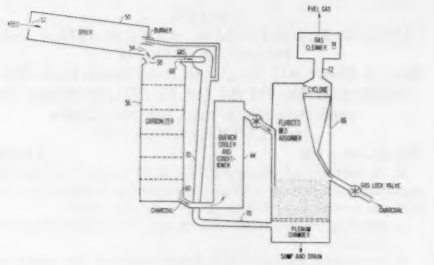
U.S. Cl. 44—24 **3 Claims**

1. A petroleum coke composition consisting of a cluster of solid petroleum coke spheroidal pellets, each pellet having a nucleus and an outside diameter in the range of about 1/32 to ¼ inch and being at least partially fused and bonded to contiguous pellets in said cluster with about 2 to 30 weight percent of a solid asphaltic-like material, and said petroleum coke pellets and solid asphaltic-like material being simultaneously produced by the delayed coking of a dispersion comprising high boiling liquid petroleum oil containing dispersed throughout about 0.01 to about 0.5 wt. percent minute particulate carbon soot seed particles produced by the partial oxidation of fossil fuels which constitute the said nucleus of said petroleum coke pellets and which have a diameter in the range of about 0.01 to 0.5 microns, an oil absorption No. of about 2–3 cc of oil per gram of carbon soot, and a surface area of about 300–1,000 square meters per gram; and wherein said petroleum coke pellets will withstand a compressive load of 14 pounds minimum when a ⅛ inch diameter pellet is tested by means of a Chatillion light spring tester and are formed and fused together by mixing 0.3 to 4.0 weight percent of liquid water with said dispersion and heating the mixture in a heating zone over a temperature range of about 650° to 930°F. for about 1 to 3 minutes to control cracking, followed by delayed coking at a temperature in the range of about 800° to 895°F. and a pressure in the range of about 20 to 60 psig.

3,852,048
PROCESS FOR PRODUCING INDUSTRIAL FUEL FROM WASTE WOODY MATERIALS

Owen Pyle, Anchorage, Ky., assignor to The Kingsford Company, Louisville, Ky.

Filed July 14, 1972, Ser. No. 271,795
Int. Cl. C10j *3/00*
U.S. Cl. 48—209 **23 Claims**



1. A process for making substantially pollution free solid and gaseous fuels from woody materials comprising the steps of:

continuously supplying said materials to a drier;

drying said materials until the moisture content thereof is less than about 15 percent;

admitting said dried materials to a carbonizer;

pyrolyzing said materials in said carbonizer to form charcoal having at least about 23 percent volatile combustible matter therein and fuel gas having a fuel value of at least about 150 B.t.u. per standard cubic foot;

collecting said charcoal, and cooling said charcoal to a temperature of not more than about 150°F;

collecting at least a major portion of said fuel gas and allowing said collected gas to cool to a temperature of not less than about 220°F;

admitting said gas and said charcoal to an adsorber;

cooling said gas in said adsorber and allowing the condensable combustible matter therein to adsorb on said charcoal to form an enriched solid fuel.

3,852,049
VITREOUS-BONDED CUBIC BORON NITRIDE ABRASIVE GRINDING SYSTEM

Louis E. Hibbs, Jr., Schenectady; Kenneth A. Darrow, Sprakers, and William R. Reed, Jr., Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 2, 1973, Ser. No. 346,920
Int. Cl. C04b *31/16*
U.S. Cl. 51—308 **3 Claims**

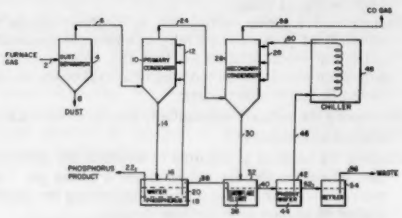
1. A vitreous-bonded abrasive article system comprising in combination cubic boron nitride grains, a borosilicate glass and metal powder filler, the metal being selected from the group consisting of molybdenum and alloys thereof.

3,852,050
PROCESS FOR RECOVERING PHOSPHORUS

Chao Hsiao, and Lawrence B. Horton, both of Pocatello, Idaho, assignors to FMC Corporation, New York, N.Y.

Filed Nov. 15, 1972, Ser. No. 306,767
Int. Cl. B01d *53/14*
U.S. Cl. 55—73 **4 Claims**

1. In the process of recovering phosphorus from a solids-free gas stream consisting essentially of carbon monoxide, elemental vaporous phosphorus and water from an electric reduction furnace wherein the phosphorus is condensed in an initial condensing zone and a secondary condensing zone, the improvement which comprises contacting the gas stream in an initial condensing zone with water at a temperature sufficient to condense a portion of the gaseous phosphorus in said gas stream to liquid phosphorus, passing said liquid phosphorus to a settling zone, passing the exit gas stream from the initial condensing zone containing residual uncondensed phosphorus

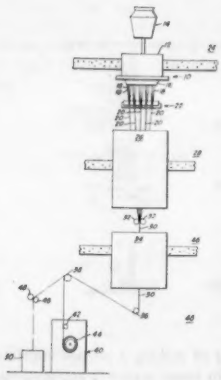


into a secondary condensing zone, contacting the gas stream in said secondary condensing zone with water at a temperature sufficient to form particles of solidified phosphorus containing water therein, passing an aqueous slurry of said particles to said settling zone and recovering liquid phosphorus from said settling zone.

3,852,051
METHOD OF COATING GLASS FIBERS WITH A COMBINED SIZING AND COATING COMPOSITION

Dennis M. Fahey, Aspinwall, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 93,937, Dec. 7, 1970, abandoned. This application Dec. 12, 1972, Ser. No. 314,284
Int. Cl. C03c *25/02;* **B32b** *17/04*
U.S. Cl. 65—3 **6 Claims**



1. A method of coating glass fibers to prepare them for use in reinforcing elastomeric compositions comprising drawing glass fibers from a supply of molten glass, coating the glass fibers as they are being drawn with a coating composition comprising an aqueous dispersion containing an elastomeric latex selected from the group consisting of natural and synthetic rubber latices, a rubber adhesive selected from the group consisting of a zinc salt and a mixture of a zinc salt in a resorcinol formaldehyde resin, said zinc salt having a solubility constant of not less than 1×10^{-3} and said zinc salt capable of complexing with ammonia, said dispersion also containing a silane coupling agent: and ammonia in a quantity sufficient to complex the zinc salt present; the quantity of coating applied being 15 to 40 percent by weight basis dry glass weight.

3,852,052
METHOD OF PRODUCING DECORATED GLASS-CERAMIC SURFACES

Henry M. Demarest, Jr., Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 12, 1973, Ser. No. 340,513
Int. Cl. C03c *21/00, 3/00*
U.S. Cl. 65—30 **9 Claims**

1. A method for producing a decorated glass-ceramic article capable of being melted electrically, comprising:

a. contacting a crystallizable glass which is substantially free of arsenic and antimony oxides with molten tin at a temperature and for a period of time sufficient to ion exchange the tin with the glass,

b. separating the glass from the molten tin and

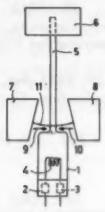
c. applying to a selected portion of a surface of the glass into which the tin has ion exchanged a stain decorating composition containing a colorant selected from the class consisting of platinum, palladium, silver and gold, and thereafter

d. heating the glass to simultaneously crystallize it and to cause the colorant to penetrate the surface of the glass in the portion where the stain decorating composition was applied.

3,852,053
METHOD OF SEALING A QUARTZ TUBE

Franz Einramhof; Leonardus Henricus Adrianus Theresia Van Kronenburg, and Ghislain Felix Alfons Arthur Verboven, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.

Continuation of Ser. No. 131,601, April 6, 1971, abandoned. This application Apr. 10, 1973, Ser. No. 349,793
Int. Cl. C03b *21/02, 33/06*
U.S. Cl. 65—34 **5 Claims**



1. A method of deforming a quartz glass body, comprising:

a. providing a plasma burner and an electrical conductor, said electrical conductor being disposed opposite said plasma burner and said plasma burner being adapted to emit plasma radiation;

b. applying an electric voltage between said plasma burner and said electrical conductor so that a secondary arc is formed therebetween, said secondary arc envelops at least a portion of said quartz body and said plasma radiation of said plasma burner being directed onto said quartz glass body; and

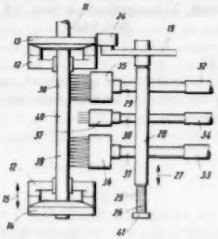
c. deforming said body so as to seal said glass body at said portion thereof and to sever said portion.

3,852,054
METHOD AND APPARATUS FOR PRODUCING AMPOULES

Hans-Joachim Dichter, Sachsendam 93, 1 Berlin 62, Germany

Filed July 6, 1973, Ser. No. 377,050
Claims priority, application Germany, July 7, 1972, 2234061
Int. Cl. C03b *23/12*
U.S. Cl. 65—109 **5 Claims**

1. A method of producing ampoules, particularly double ampoules, which comprises drawing an elongated thin neck into a glass tube at a distance from the end of the tube corresponding to the length of one ampoule body, said neck being twice the normal length of an ampoule neck and being later divided in the middle, and, at a distance from the end of the neck equal to the length of a second ampoule body, melting



off at least one ampoule from the tube with the simultaneous closing of each ampoule bottom, characterised in that during the drawing of the ampoule neck that portion of the double neck where separation is to be effected is cooled to form a funnel-shaped end on each single length neck.

3,852,055
NONCAKING FERTILIZERS

George R. Hawkes, Concord; Clive Hodgson, Forest Knolls; Marion G. Reed, Hacienda Heights, and William G. Toland, San Rafael, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 15, 1973, Ser. No. 323,571
Int. Cl. C05c *1/02*
U.S. Cl. 71—59 **18 Claims**

1. A particulate ammonium salt composition having intimately admixed therewith from about 0.01 to 5% by weight, based on weight total composition, of a hydroxy-aluminum polymer having a hydroxyl to aluminum mol ratio of about 1 to 2.9.

3,852,056
HETEROCYCLIC-SUBSTITUTED N-IMIDAZOL PLANT-ROWTH INFLUENCING AGENTS

Wilfried Draber, Wuppertal-Elberfeld; Erik Regel, Wuppertal-Cronenberg; Karl Heinz Buchel, Wuppertal-Elberfeld; Ludwig Eue, Cologne, and Robert R. Schmidt, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 24, 1970, Ser. No. 75,264
Claims priority, application Germany, Sept. 27, 1969, 1949013
Int. Cl. A01n , *9/20*
U.S. Cl. 71—76 **1 Claim**

1. Method of inhibiting the growth of plants which comprises applying an effective amount of phenyl-4-chlorophenyl-3-(5-methyl)-isoxazolimidazolyl-1-yl methane.

3,852,057
METHOD FOR CONTROLLING AXILLARY SHOOTS OF TOBACCO PLANTS

Thomas W. Findley, La Grange, and John F. Benner, Chicago, both of Ill., assignors to Swift & Company, Chicago, Ill.

Filed May 3, 1965, Ser. No. 452,881
Int. Cl. A01n
U.S. Cl. 71—78 **3 Claims**

1. A method of controlling the growth of the axillary shoots of a tobacco plant which comprises contacting said shoots with a growth-controlling amount of n-dodecyl 2-hydroxypropyl ether.

3,852,058
HERBICIDAL COMPOSITIONS AND METHODS

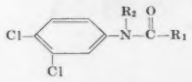
Clarence W. Huffman, Grandview, Ill., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. Nos. 108,317, May 8, 1961, abandoned, and Ser. No. 108,257, May 8, 1961, abandoned, which is a continuation-in-part of Ser. No. 661,575, May 27, 1957, abandoned. This application Nov. 18, 1965, Ser. No. 508,566

Int. Cl. A01n *9/20*

U.S. Cl. 71—118 **7 Claims**

1. Method of inhibiting the growth of plants which comprises applying thereto in an effective inhibiting amount a compound of the formula:



wherein R_1 and R_2 are lower alkyl.

3,852,059
PROCESS FOR THE PRODUCTION OF SODIUM CHROMATE FROM CHROMITE ORE

Charles Patrick Bruen, Bernardsville, N.J.; William Wayne Low, Syracuse, and Edmund Walter Smalley, Brewerton, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Mar. 9, 1972, Ser. No. 233,351

Int. Cl. C22b *1/14*

U.S. Cl. 75—3 **13 Claims**

1. A method of producing a green pellet which comprises pelleting a composition prepared by mixing chromite ore with sodium carbonate employing as a pelleting liquid an aqueous solution containing at least about 5 percent by weight of at least one electrolyte selected from the group consisting of sodium hydroxide, sodium aluminate, sodium silicate, and sodium chromate in the absence of added alkaline earth compound, said pelleting liquid being employed in an amount sufficient to contribute about 0.5 to 25 percent of said electrolyte to the weight of the pellet, dry basis.

3,852,060
FORMATION OF METAL FILAMENTS BY SOLID STATE REACTIONS

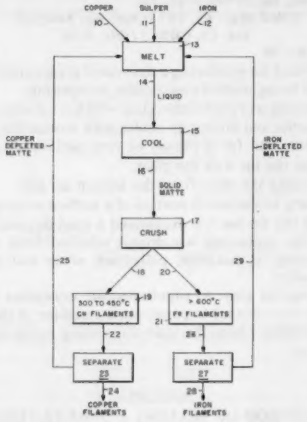
Howard W. Leavenworth, Jr., Bethesda; Beverly W. Dunning, Jr., Adelphi; Robert C. Gabler, Jr., Grasonville, and Carl E. Goldsmith, Brandywine, all of Md., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed June 25, 1973, Ser. No. 359,400

Int. Cl. B22f *9/00*

U.S. Cl. 75—.5 B **17 Claims**

1. A process for making metal filaments which comprises:
heating a mixture of copper, iron and sulfur to a temperature above about 800°C to form a matte which is stoichiometrically deficient in sulfur;
cooling the matte;
comminuting the cooled matte to form matte particles having a substantial surface area;
heating the matte particles to a temperature above about 300°C in a nonreactive atmosphere to grow metal filaments from the surfaces of the matte particles;
cooling the matte, now depleted in metal, and the metal filaments to a temperature below 300°C;



detaching metal filaments from the metal-depleted matte surfaces, and
separating metal filaments from the metal-depleted matte.

3,852,061
PROCESS AND EQUIPMENT FOR THE TREATMENT OF A MATERIAL BY MEANS OF AN ARC DISCHARGE PLASMA

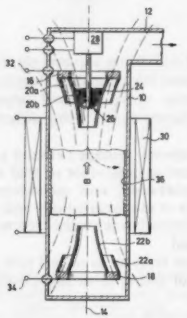
Heinrich Wulff, Munich, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed Nov. 20, 1972, Ser. No. 307,838

Claims priority, application Germany, Nov. 20, 1971, 2157606

Int. Cl. C22d *7/00;* **H05b** *7/18*

U.S. Cl. 75—10 R **6 Claims**



1. A process for the treatment of material by means of an arc discharge plasma in a region of a discharge vessel between two axially spaced electrodes, comprising the following steps:
a. maintaining during the process the average pressure in said region at less than one atmosphere;
b. producing a magnetic field running substantially parallel to the axis forming the connection line between said electrodes, and which has in at least one part of said region such a high value that the product $\Omega\tau$ of the elec-

tron gyration frequency Ω in the plasma and the time τ within which on an average electron transmits its impulse to the ions of the plasma is greater than 1, and that the arc discharge plasma in said region as a whole in itself rotates around a middle magnetic field line to which the plasma is substantially symmetrical;

c. bringing said material into a part of said region close to the mid-point of said magnetic field under said condition of $\Omega\tau > 1$, whereby a reciprocal action with the plasma occurs, and said material is centrifuged radially outward; and

d. recovering treated material from the space lying radially outside of said region.

3,852,062

PROCESS AND A DEVICE FOR EVEN DISTRIBUTION AND ALTERNATING SUPPLY OF LIQUID AND GASEOUS PROTECTIVE MEDIA FOR THE REFINING GAS TUYERES OF A CONVERTER

Helmut Knuppel; Karl Brotzmann, and Hans Georg Fassbinder, all of Sulzbach Rosenberg, Germany, assignors to Eisenwerk Gesellschaft, Maximilianshutte M.B.H., Rosenberg, Germany

Filed Dec. 8, 1972, Ser. No. 313,308

Claims priority, application Germany, Dec. 9, 1971, 2161000

Int. Cl. C21c *5/34*

U.S. Cl. 75—60 **8 Claims**

1. A process for the even distribution and supply of protective media to refining gas tuyeres in a converter, wherein the individual tuyeres consist of two concentric tubes, refining gas, being passed through the central one of the tubes and a liquid or gaseous protective medium being supplied through the annular space between the two tubes, wherein the improvement comprises providing the protective medium from a supply at super atmospheric pressure and lowering the pressure of said protective medium by at least two atmospheres absolute pressure prior to entry of said medium into the tuyeres, said pressure being lowered by means of throttling devices to approximately half the pressure at which said medium is supplied.

3,852,063

HEAT RESISTANT, ANTI-CORROSIVE ALLOYS FOR HIGH TEMPERATURE SERVICE

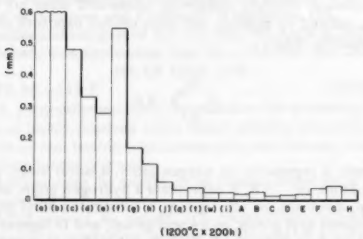
Itaru Niimi, Nagoya; Yasuhisa Kaneko, Toyota; Masamitu Noguchi, Toyota; Tsuneo Uchida, Toyota, and Youhei Katori, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Filed Oct. 4, 1972, Ser. No. 294,981

Claims priority, application Japan, Oct. 4, 1971, 46-77651

Int. Cl. C22c *37/10, 39/14*

U.S. Cl. 75—124 **4 Claims**



1. A heat-resistant, anti-corrosive alloy for high temperature service, said alloy consisting essentially of:

less than 0.07 percent by weight carbon,
less than 0.5 percent by weight silicon,
15 to 21 percent by weight chromium;
2.5 to 4.0 percent by weight aluminum,
0.5 to 1.2 percent by weight molybdenum,
0.5 to 1.1 percent by weight vanadium,
less than 0.45 percent by weight titanium,
less than 0.18 percent by weight zirconium,
0.1 to 0.5 percent by weight of an element selected from the group consisting of niobium and tantalum,
at least one element selected from the group consisting of: yttrium in an amount less than 1.5 percent by weight, beryllium in an amount less than 2.0 percent by weight, and boron in an amount less than 0.0050% by weight;
and the balance of iron and inevitable impurities.

3,852,064

USE OF DIOXAZINE PIGMENT IN THE PHOTOELECTROPHORETIC PRODUCTION OF IMAGES

Georgeos Zographos, Zurich; Andre Pugin, Riehen, and Kurt Burdeska, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

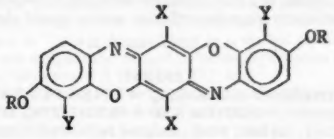
Filed Dec. 26, 1972, Ser. No. 318,320

Claims priority, application Switzerland, Dec. 28, 1971, 19047/71

Int. Cl. G03g *13/00, 5/00, 7/00*

U.S. Cl. 96—1.3 **4 Claims**

1. Process for the photoelectrophoretic production of images, wherein a layer of a suspension is exposed to an electrical field between two electrodes of which at least one is transparent and the suspension is simultaneously exposed to an image with an actinic radiation through the transparent electrode, whereupon a pigment image which consists of particles which have migrated is produced on at least one of the electrodes, with the suspension containing a plurality of fine particles of at least one colour which contain a light-sensitive pigment, characterised in that the light-sensitive pigment used is a dioxazine



wherein R denotes an alkyl group with 1–4 C atoms or an optionally substituted phenyl group, X denotes a hydrogen, chlorine or bromine atom and Y denotes a chlorine or bromine atom.

3,852,065

PHOTOCONDUCTIVE BISPHENYL THIOCOMPOUNDS LINKED BY BRIDGING ORGANIC GROUP

Adrianus Marie Petrus Hectors, Venlo, Netherlands, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

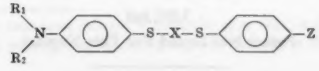
Filed May 14, 1971, Ser. No. 143,587

Claims priority, application Great Britain, May 14, 1970, 23484/72

Int. Cl. G03g *5/06, 13/16, 13/22*

U.S. Cl. 96—1.4 **15 Claims**

1. A photoconductive composition comprising in admixture with an electrically insulating polymeric organic binder a monomeric organic photoconductor which is a compound having the formula:



wherein R_1 and R_2 each represents a lower alkyl radical, a 5- or 6-membered cycloalkyl radical or an aryl-lower alkyl, or R_1 and R_2 together with the nitrogen atom to which they attach form a morpholine ring; Z represents a hydrogen or halogen atom, a lower alkyl or lower alkoxy radical, or an amino group

in which R_3 and R_4 each represents a hydrogen atom, a lower alkyl radical, a 5- or 6-membered cycloalkyl radical or an aryl-lower alkyl, or R_3 and R_4 together with the nitrogen atom to which they attach form a morpholine ring; and X is a lower aliphatic or an aryl radical or a heterocyclic residue containing at least one nitrogen, oxygen or sulfuration.

3,852,066

SILVER HALIDE WITH AN ORTHORHOMBIC LEAD MONOXIDE AND SENSITIZING DYE

Boris Levy, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 195,785, Nov. 4, 1971, abandoned, which is a continuation-in-part of Ser. No. 102,774, Dec. 30, 1970, abandoned. This application Mar. 15, 1973, Ser. No. 341,707The portion of the term of this patent subsequent to Apr. 18, 1989, has been disclaimed.

Int. Cl. G03g *5/08;* **G03c** *1/28, 1/10*

U.S. Cl. 96—1.6 **26 Claims**

1. A photosensitive element which comprises a particulate dispersion of silver halide crystals adapted to be reduced to silver upon contact with a silver halide reducing agent, as a function of said crystals' exposure to incident electromagnetic radiation actinic thereto, having associated therewith in electron donating relationship and sensitizing dye and an orthorhombic lead monoxide semiconductor, each of said dye and semiconductor adapted to donate electrons to said silver halide crystals as a function of the exposure of said element to incident electromagnetic radiation actinic to said element.

3,852,067

PHOTOSENSITIVE ELEMENT WITH SILVER HALIDE, A SEMICONDUCTOR AND A SENSITIZING DYE

Boris Levy, Sayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 195,785, Nov. 4, 1971, abandoned, which is a continuation-in-part of Ser. No. 102,774, Dec. 30, 1970, abandoned. This application Mar. 15, 1973, Ser. No. 341,708

Int. Cl. G03g *5/08;* **G03c** *1/28, 1/10*

U.S. Cl. 96—1.6 **27 Claims**

1. A photosensitive element which comprises a particulate dispersion of silver halide crystals adapted to be reduced to silver upon contact with a silver halide reducing agent, as a function of said crystals' exposure to incident electromagnetic radiation actinic thereto, having associated therewith in electron donating relationship a sensitizing dye and an inorganic, substantially water-insoluble oxygen-free semiconductor, said semiconductor comprising one or more elements from Group IIIa to VIa, inclusive, of the Periodic Table of Elements, possessing an atomic number **13** and **81**, wherein said inorganic semiconductor is disposed in electron-donating relationship with said sensitizing dye, said dye and semiconductor adapted to donate electrons to said silver halide crystals as a function of the exposure of said element to incident electromagnetic radiation actinic to said element.

3,852,068

Patent Not Issued For This Number

3,852,069

APPLICATION OF MAGNETIC RECORDING STRIPS TO MOTION PICTURE FILM

August Jean Van Paesschen, Antwerpen, and Joseph Antoine Herbots, Edegem, both of Belgium, assignors to AGFA Gevaert, Mortsel, Belgium

Division of Ser. No. 220,487, Jan. 24, 1972,. This application Dec. 3, 1973, Ser. No. 421,266

Claims priority, application Great Britain, Jan. 25, 1971, 3101/71

Int. Cl. G03c *5/14, 1/84*

U.S. Cl. 96—39 **4 Claims**

1. Multilayer motion picture film material comprising a cellulose triacetate support, at least one light-sensitive emulsion layer and at the opposite side of said support an antihalation layer comprising an alkali-soluble polymeric binder containing free carboxyl groups and capable of being detached from said support in the presence of an alkaline medium, and deposited upon said antihalation layer stripes of a coating composition of magnetizable material dispersed in an alkali-insoluble binder in admixture with an organic compound having at least two aziridine groups reactive with the carboxyl groups of said polymeric binder.

3,852,070

PHOTO-IMAGING UTILIZING URANYL COMPOUNDS

Steven Levinos, Chatham, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Aug. 24, 1972, Ser. No. 283,465

Int. Cl. G03c *5/24, 1/00*

U.S. Cl. 96—48 R **4 Claims**

1. Imaging material comprising a support and a coating thereon of a light-sensitive composition consisting essentially of a water-soluble uranyl compound and a water-soluble formate salt in intimate admixture with a substantially water-dispersible film-forming binder selected from the group consisting of polyvinyl alcohol, hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxymethyl cellulose, sodium carboxymethyl cellulose, and saponified cellulose esters.

3,852,071

PROCESS OF PRODUCING POSITIVE IMAGES

Shinpei Ikenoue, and Eiichi Mizuki, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

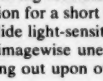
Filed Nov. 8, 1972, Ser. No. 304,879

Claims priority, application Japan, Nov. 9, 1971, 46-89266

Int. Cl. G03c *5/24, 1/28*

U.S. Cl. 96—64 **30 Claims**

1. A process of forming positive images which comprises subjecting a light-developable silver halide light-sensitive material having a layer of silver halide grains having occluded therein at least one bismuth compound and containing at least one mercaptan compound which is a non-halogen acceptor represented by the following formula to an imagewise exposure of a high illumination for a short period of time and then subjecting the silver halide light-sensitive material to an overall exposure, whereby imagewise unexposed areas are selectively colored by printing out upon overall exposure to yield the positive image:



wherein X represents an oxygen atom, a sulfur atom, a selenium atom, or —NR; R represents a hydrogen atom, an alkyl group, a substituted alkyl group, a substituted alkyl group, a substituted aryl group, or an aryl group; and D represents an o-phenylene group, a substituted o-phenylene group, a 1,2-naphthylene group, a substituted 1,2-naphthylene group, a 2,3-naphthylene group, or a substituted 2,3-naphthylene group.

3,852,072
PHOTOGRAPHIC PRODUCTS AND PROCESSES COMPRISING SYNTHETIC NUCLEAR ISOTOPES

Arthur M. Gerber, Boston, and Vivian K. Walworth, Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 11, 1972, Ser. No. 252,270
Int. Cl. G03c *1/02, 1/28*
U.S. Cl. 96—94 R **25 Claims**

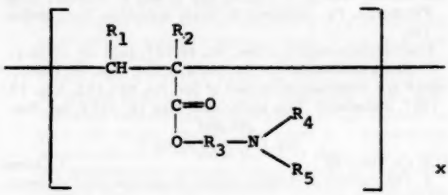
1. The method for enhancing photographic sensitivity of a silver halide emulsion which comprises disposing a nuclear radiation source in the silver halide emulsion prior to casting a layer of said emulsion in an amount sufficient to provide sufficient interaction with the silver halide grains to provide said enhanced sensitivity.

3,852,073
SILVER HALIDE EMULSIONS COMPRISING POLYMERIC PEPTIZERS

Maurice J. Fitzgerald, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 103,305, Dec. 31, 1970, abandoned. This application Oct. 4, 1972, Ser. No. 294,979
Int. Cl. G03c *1/04*
U.S. Cl. 96—114 **23 Claims**

1. A photosensitive silver halide emulsion wherein the silver halide peptizer comprises a water-soluble homopolymer having in its molecule repeating units with the general formula:



wherein:

R_1 is selected from the group consistng of hydrogen, lower alkyl and halogen; R_2 is selected from the group consisting of hydrogen, lower alkyl, halogen and cyano; R_3 is selected from the group consisting of lower alkyl and lower cycloalkyl; R_4 and R_5 are each selected from the group consisting of hydrogen, lower alkyl, and lower cycloalkyl; R_4 and/or R_5 may be chemically joined with R_3 to form a ring structure; and x is a positive integer greater than 1.

3,852,074
PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING ORGANIC NOBLE METAL COMPOUNDS

Richard M. Rosenberg, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 25,236, April 2, 1970, abandoned. This application May 22, 1972, Ser. No. 255,816
Int. Cl. G03c *1/68*
U.S. Cl. 96—115 P **10 Claims**

1. A photopolymerizable composition for producing high yields of highly resolved noble metal patterns comprising on organic solvent having constituents dissolved therein, wherein said constituents comprise:

a. 5–85 percent, by weight, of an organic noble metal compound; **0**

b. 5–30 percent, by weight, of a photopolymerizable compound(s) containing at least 50 percent of a polyfunctional acrylate derived from a polyol in which the hydroxyl groups are separated by at least three atoms;

c. 0.5–10 percent, by weight, of an organic sensitizer;

d. 0–60 percent, by weight, of organosulfur compound(s);

e. 0–50 percent, by weight, of a flux; and

f. 0–15 percent, by weight, of a polymeric ester.

3,852,075
HARD SURFACE RINSE-COATING COMPOSITION AND METHOD

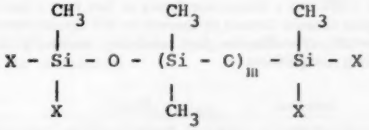
Marino Sidney Basadur, Evendale, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 16, 1973, Ser. No. 407,031
Int. Cl. C09g *1/14*; C09k *1/02*
U.S. Cl. 106—11 **14 Claims**

1. An aqueous rinse-coating composition which consisting essentially of:

a. 1.45–2.7 percent by weight non-volatile mineral oil;

b. 4.2–6.3 percent by weight amine functional polydimethylsiloxane which is the reaction product of an endblocked polydimethylsiloxane having the formula



wherein X is selected from the group consisting of acetoxy, alklyamino, benzamido and butanonoxime, m is selected so that the viscosity of said polydimethylsiloxane is from 10 to 15,000 cs. at 25°C, and a silane selected from the group consisting of

$$R''_n(R'O)_{3-n}Si(CH_2)_3NHR'''$$

and

$$R''_n(R'O)_{3-n}SiRNHCH_2CH_2NH_2$$

wherein n has a value of from 0 to 2, R is saturated divalent hydrocarbon radical containing 3 to 4 carbon atoms, R′ is an alkyl radical containing 1 to 4 carbon atoms, R″ is a saturated monovalent hydrocarbon radical containing 1 to 6 carbon atoms, and R‴ is a hydrogen atom or a methyl radical, and wherein the weight ratio of said polydimethylsiloxane to said silane is from about 1:1 to about 20:1; and

c. 1.75–3.1 percent by weight cationic emulsifier; wherein the weight ratio of non-volatile mineral oil to amine functional polydimethylsiloxane is from 0.20 to 0.80.

3,852,076
AQUEOUS METHOD OF MICROENCAPSULATION AND CAPSULES

Stephen Charles Grasko, Los Angeles, Calif., assignor to John W. Ryan, Los Angeles, Calif.

Filed Feb. 22, 1972, Ser. No. 228,270
Int. Cl. C09d *11/14, 1/04, 3/12*
U.S. Cl. 106—26 **46 Claims**

1. A method of forming water insoluble particles having a core consisting essentially of a polar group affording organic material and a membrane consisting essentially of an inorganic silicate surrounding and reacted with said polar group of said organic material, which method consists essentially of co-mingling polar group affording organic material and an aqueous colloidal solution of inorganic silicate, said inorganic silicate being essentially the only reactant for said polar groups and being present in an amount at least sufficient to react with polar groups of said polar group affording organic material to form water insoluble particles within a continuous aqueous phase, said particles having a size above colloidal dimensions, where

a. said inorganic silicate is hectorite type clay; and

b. said polar group affording organic material is character-

ized by the ability to form water insoluble particles having a size above colloidal dimensions when added to an aqueous colloidal solution of synthetic lithium hectorite clay and tetrasodium pyrophosphate peptizing agent, with co-mingling, which polar group affording organic material is selected from the class consisting of (i) simple organic compounds having at least one polar group, (ii) organic hydrophilic colloids, and (iii) water emulsion polymer latexes containing at least one material from (i) and (ii), excluding the water soluble cellulose ether hydrophilic colloids.

3,852,077
GLASSES, GLASS-CERAMICS AND PROCESS FOR MAKING SAME

James Erich Rapp, Oregon, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 5, 1972, Ser. No. 241,448
Int. Cl. C03c *3/22, 3/12*
U.S. Cl. 106—39.6 **15 Claims**

1. A glass ceramic material having a dielectric constant of about 1,099 and a dissipation factor of less than 4 percent, said glass ceramic formed by thermal in situ crystallization of a thermally crystallizable glass consisting essentially of the following composition:

Ingredient	Mole %
GeO_2	18–40
Nb_2O_5	25–45
Alkali metal oxides	25–45

wherein said alkali metal oxides are a mixture of Na_2O + K_2O and/or Li_2O, the molar ratio of said Na_2O to said K_2O and/or Li_2O is from about 1:1 to about 3:1,

the molar ratio of said alkali metal oxides to said Nb_2O_5 is from 0.7:1 to 1.4:1 and,

when said molar ratio of said alkali metal oxides to said Nb_2O_5 is about 1:1, then said oxide and said Nb_2O_5 must be present in amounts of at least 30 mole percent each.

3,852,078
MASS OF POLYCRYSTALLINE CUBIC SYSTEM BORON NITRIDE AND COMPOSITES OF POLYCRYSTALLINE CUBIC SYSTEM BORON NITRIDE AND OTHER HARD MATERIALS, AND PROCESSES FOR MANUFACTURING THE SAME

Masao Wakatsuki, 62 Ichizawa-cho, Asohi-ku, Yokohama; Kazuaki Ichinose, 6278 Ohba, Fujisawa-shi, Kanagawa-ken; Riyuitiro Mori, 1-22, Komukainishimachi, Kawasaki-shi, and Toshio Aoki, 3-7, Shiomidai, Isogo-ku, Yokohama-shi, all of Japan

Filed Dec. 23, 1971, Ser. No. 211,564
Claims priority, application Japan, Dec. 24, 1970, 45-117230; Dec. 30, 1970, 45-122892; Dec. 30, 1970, 45-122906
Int. Cl. C04b *35/52*
U.S. Cl. 106—43 **12 Claims**

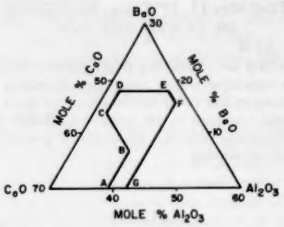
1. A hard mass comprising a matrix and a dispersed phase substantially comprising more than ten percent by weight of polycrystalline cubic system boron nitride as the matrix and granular diamond homogenously dispersed within and bonded by the polycrystalline cubic system boron nitride matrix.

3,852,079
BAO-CAO-AL_2O_3 GLASS COMPOSITIONS

Robert F. Davis, Cary, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 20, 1972, Ser. No. 299,628
Int. Cl. C03c *13/00*
U.S. Cl. 106—50 **6 Claims**

1. A composition for a glass which is composed, in mole percent on the oxide basis, of BaO, CaO and Al_2O_3 in proportions falling within the area or along the boundaries of the



polygon ABCDEFGA shown in the BaO-CaO-Al_2O_3 ternary composition diagram comprising FIG. 1 of the DRAWING.

3,852,080
METHOD FOR MAKING MAGNESITE BRICK

Ben Davies; George F. Carini, and Ernest P. Weaver, all of Pittsburgh, Pa., assignors to Dress Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 48,937, June 19, 1970, , which is a continuation of Ser. No. 858,524, Sept. 16, 1969, , which is a continuation-in-part of Ser. No. 661,193, Aug. 17, 1967, abandoned. This application May 16, 1973, Ser. No. 360,885
Int. Cl. C04b *35/04*
U.S. Cl. 106—58 **7 Claims**

1. The method of making burned magnesite brick comprising the steps of:

A. forming a size-graded batch consisting essentially of synthetic dead-burned magnesite having a lime:silica weight ratio in excess of 2:1 and at least 0.1 per cent, by weight, of the total batch finely divided silica, the MgO content of the overall batch being from 90 to about 96 per cent, the lime:silica weight ratio of the overall batch being between 2:1 and 1.4:1, the batch analyzing less than 3.0 per cent R_2O_3 oxides, less than 0.5 per cent TiO_2, less than 0.5 per cent Al_2O_3 and less than 0.05 per cent B_2O_3;

B. tempering the batch with a temporary binder;

C. pressing the tempered batch into brick;

D. drying the brick; and

E. firing at temperatures in excess of 2,800°F.

3,852,081
CEMENT COMPOSITIONS CONTAINING ALPHA GYPSUM HAVING IMPROVED LONG-TERM DURABILITY

Carl Theodore Lehman, Arlington Heights, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed July 30, 1973, Ser. No. 383,745
Int. Cl. C04b *7/02, 11/12*
U.S. Cl. 106—89 **10 Claims**

1. A cement composition which when set is resistant to subsequent deterioration by substantial expansion, weight gain, and loss of compressive strength comprising a mixture of, by weight, about 49–94 percent of alpha calcium sulfate hemihydrate; about 49–5 percent of a portland cement containing not more than about 7 percent by weight tricalcium aluminate; and about 0.5–0.8 percent of a dispersing agent.

3,852,082

FIBRE REINFORCED CEMENT

Amalendu Jyoti Majumdar, St. Albans, England, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 127,361, March 23, 1971, Pat. No. 3,783,092. This application July 26, 1972, Ser. No. 275,421

Claims priority, application Great Britain, Aug. 5, 1971, 36856/71

Int. Cl. C04b 7/12

U.S. Cl. 106—99 17 Claims

1. A fibre-reinforced pozzolanic cement product in which the cement matrix contains at least 10% by weight of a pozzolana and from 0.5 to 10% by weight of fibres which are alkali-resistant glass fibres comprising a silica/zirconia glass containing at least 6.0 mol percent of zirconia.

3,852,083

MANUFACTURE OF PLASTER OF PARIS PRODUCTS CONTAINING LATEX

Julie Chi-sun Yang, 45L Franklin Green South, Somerset, N.J. 08873

Continuation-in-part of Ser. No. 239,752, March 30, 1972, abandoned. This application Sept. 22, 1972, Ser. No. 291,498

Int. Cl. C04b 11/00

U.S. Cl. 106—111 26 Claims

1. A process for the production of good quality, shaped, set plaster of Paris products, which comprises:

a. providing an unset mixture comprising, on a dry basis, 30 to 80 weight percent of plaster of Paris, 0.1 to 30 weight percent of fiber, 0.05 to 10 weight percent of hydromodifier, 0.5 to 10.0 weight percent of latex, and 0 to 60 weight percent of auxiliary cementing agent, with individual concentrations within these ranges selected to total 100 weight percent, and water in a water:solids weight ratio of from about 0.20:1 to about 0.80:1, with the proportionate amounts being such as to cause said mixture to be a plastic tractable mixture having shape retaining characteristics, enhanced plastic flow characteristics, and capacity for resisting dewatering under relatively high pressures so as to enable the mixture to flow and to prevent the separation of an appreciable amount of water from the mixture, when said mixture is subjected to pressures of considerable magnitude such as is normally developed in plastic forming operations exemplified by those employing ram and auger extruders;

b. plastic forming said mixture under pressure of the order described in part (a) above, without separating an appreciable amount of water from said mixture, to produce a shaped body which is generally shape retaining; and

c. subjecting said shaped body to plaster of Paris setting conditions, to set said shaped body and impart strength to the resulting shape retaining set product.

3,852,084

CEMENTITIOUS COMPOSITION CONTAINING ACTIVATED LIME-FLY ASH MIXTURE

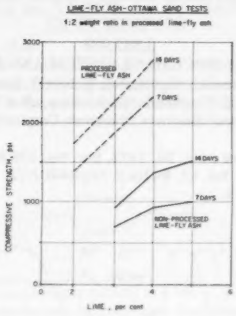
William C. Webster, 3008 Potshop Rd., Norristown, Pa. 19403, and Charles L. Smith, 34 Corson Rd., Conshohocken, Pa. 19428

Continuation-in-part of Ser. No. 23,887, March 30, 1970,. This application Aug. 31, 1972, Ser. No. 285,257

Int. Cl. C04b 7/34

U.S. Cl. 106—118 3 Claims

1. A method of producing a hardenable, load-bearing composition comprising placing, in a space where a hardened composition is required, cementitious composition consisting of a mixture of at least 65%, by weight, untreated fly ash and no more than 35%, by weight, of a pre-mix consisting of from 10 to 96 weight % highly activated, reduced particle size fly ash composition, and 4 to 90 weight % deagglomerated lime, the maximum particle size dimension of which is generally



below 35 microns, said lime constituting from 1 to 40 weight % of said composition.

3,852,085

STABLE REFRACTORY SLURRY COMPOSITION

Ginter Vurlicer, Beaumont, Tex., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 9, 1974, Ser. No. 431,861

Int. Cl. C08h 17/02; C08b 27/02

U.S. Cl. 106—193 R 9 Claims

1. A suspending agent system useful for suspending refractory grains comprising (a) carboxymethyl cellulose and (b) a water-soluble carboxyvinyl polymer having a molecular weight within the range of about 250,000 to 4,000,000 in a total amount of about 36 to 65 weight percent with the relative amount of (a) to (b) varying from a weight percent ratio of about 1:4 to 4:1 and (c) magnesium montmorillonite clay in a concentration of about 35 to 64 weight percent.

3,852,086

SOLID DIFFUSION SOURCES FOR PHOSPHORUS DOPING

Yorihiro Murata, North Tonawanda, and Carl H. McMurtry, Lewiston, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed June 28, 1973, Ser. No. 374,706

Int. Cl. C08h 17/24

U.S. Cl. 106—286 8 Claims

1. A solid phosphorus containing source body for semiconductor diffusion doping, said body comprising from about 5 to about 95% by weight of compounds of silicon and phosphorus selected from the group consisting of SiP_2O_7, $Si_5P_2O_{13}$, and mixtures thereof, and from about 95 to about 5% by weight of an additive material having a melting point greater than 2000°C, selected from the group consisting of Al_2O_3, CaO, HfN, HfO_2, MgO, NbN, TaN, ThO_2, TiN, VN, Y_2O_3, ZrN, ZrO_2, and $ZrSiO_4$.

3,852,087

COMPOSITE PIGMENT FOR BLOCKING TANNIN

John S. Nordyke, 440 Sulgrave Rd., Pittsburgh, Pa. 15211, and William C. Spangenberg, 236 Parker Dr., Mt. Lebanon, Pa. 15216

Continuation-in-part of Ser. No. 236,955, March 22, 1972, abandoned. This application Jan. 28, 1974, Ser. No. 436,975

Int. Cl. C08h 17/04

U.S. Cl. 106—288 B 14 Claims

1. The method of rendering a water-based paint capable of inhibiting the migration of tannins through paint coatings

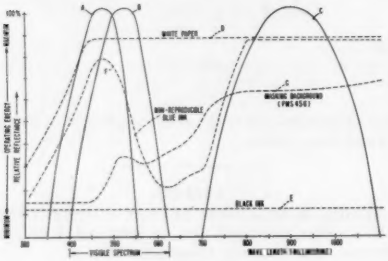
when applied to the surface of wood which contains tannins, comprising incorporating into a pigment-containing water-based paint composition an amount of at least one amphoteric metal hydrate effective to insolubilize and thereby inhibit the migration of said tannins through said paint coating.

3,852,088

SECURITY DOCUMENT SYSTEM AND METHOD

Robert B. Godlewski, Hightstown; Robert D. Harris, Somerset, and Michael J. Tinghitella, Hightstown, all of N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1972, Ser. No. 235,980
Int. Cl. B41m *3/14*; B44f *1/12*
U.S. Cl. 117—1 **10 Claims**



1. The method of precluding generation of legible copies of human readable indicia from a master by any one of a plurality of convenience office copiers having different operating energy ranges, comprising the steps of

providing an ink of a color that is highly reflective across the operating energy range of at least one group of copiers including electrostatic copiers operating predominantly in the blue region of the spectrum and thermographic copiers operating in the infrared region of the spectrum, but which ink is at least partially absorptive within different operating energy ranges of another group of copiers including electrostatic copiers operating predominantly in the green to blue-green regions of the spectrum,

providing on the master a background of another color that absorbs light within such different operating energy ranges and masks the ink color which would be legible in the blue-green to green regions, and

printing the human readable indicia over said background with said ink,

whereby said copiers of said one group will fail to reproduce the indicia printed in said ink because of its reflectance and said other group of copiers will reproduce illegible indicia printed in said ink and masked by said background.

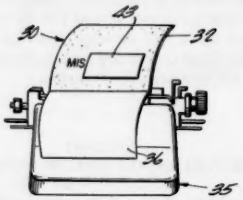
3,852,089

METHOD FOR CORRECTING MISTYPED BUSINESS FORMS

Victor Barouh, 935 Plum Tree Rd., W., Westbury; Robert Glenn, 70-20 108th St., Forest Hills, and Sylvester Giaccone, 99-05 59th Ave., Flushing, all of N.Y.

Filed Apr. 5, 1972, Ser. No. 241,305
Int. Cl. B41m *5/00*; B32b *35/00*
U.S. Cl. 117—2 TC **3 Claims**

1. A method of correcting a mistyped carbonless business form set, including an original sheet provided with a chemical coating on the back face thereof and a different chemical coated copy sheet having an encapsulated receptor coating on the other side thereof, comprising the steps of providing a first opaquing sheet including a substrate having a pressure-transferable pigmented coating having a tacky surface, placing said first opaquing sheet in front of said copy sheet with said coating adjacent to said copy sheet, providing a second opaquing sheet having a pressure-transferable coating, placing said second opaquing sheet over said original sheet with said coating adjacent to said original sheet, retyping the error to transfer said coating from first opaquing sheet and said coating from the second opaquing sheet to said copy sheet and said original sheet, and removing said opaquing sheets, then inserting over the opaqued error on copy sheet or sheets, an image transfer sheet having a coating of a color corresponding to the



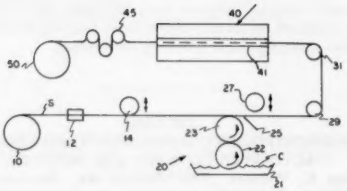
characters formed by reaction after typing of said coated and said encapsulated coated sheets, then retyping the correct indicia on said original sheet and thereafter removing said image transfer sheet, said coating of said first opaquing sheet including a base coat and a top coat, said first opaquing sheet having a shield between said base coat and said substrate, said tacky surface including aluminum stearate and ethylcellulose, said image transfer sheet comprising coating of a pigment, a binder and a plasticizer.

3,852,090

WATERPROOF, BREATHABLE COATED TEXTILE SUBSTRATE

William A. Leonard, Lyman; Anthony F. Kunak, Spartanburg; Cecil M. Burns, Greer, and Warren N. Parsons, Spartanburg, all of S.C., assignors to M. Lowenstein & Sons, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 238,250, March 27, 1972, , which is a continuation of Ser. No. 885,831, Dec. 17, 1969, abandoned. This application Oct. 2, 1972, Ser. No. 294,354
Int. Cl. B44d *1/02*; D09d *1/00*
U.S. Cl. 117—14 **9 Claims**

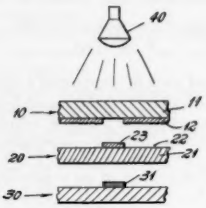


1. A waterproof, breathable textile substrate, said substrate having an extensible film coating secured to one side of said substrate only, said film having been formed in situ substantially covering said side of said substrate and not striking through said substrate and having a characteristic of at least about 1,000 per cent extensibility based on a film thickness of 0.005 inch, said substrate being waterproof from the direction of said uncoated side.

3,852,091
THERMOGRAPHIC TRANSFER SHEETS

Douglas A. Newman, Glen Cove, N.Y., assignor to Columbia Ribbon & Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

Division of Ser. No. 109,132, Jan. 25, 1971, Pat. No. 3,751,318. This application Sept. 11, 1972, Ser. No. 288,016
Int. Cl. B41c 1/06
U.S. Cl. 117—36.1 4 Claims



1. Thermographic transfer sheet comprising a flexible foundation carrying a uniform thin volatile-liquid-applied imaging layer of discrete particles which soften at a temperature within the range of from about 150° F to 220° F comprising a major amount by weight of wax and a minor amount by weight of resinous film-former having a higher melting point than the wax, the particles being separated, at least partially, by an interface and air avoids to form areas which are transferable to a copy sheet, the said air voids and interfaces providing a thermal insulation and weakened severing points between heated and unheated particles.

3,852,092
THERMALLY RESPONSIVE ELASTIC MEMBRANE

James A. Patterson, and Eugene D. Finkle, both of P.O.Box 304, Menlo Park, Calif. 94025

Filed June 5, 1972, Ser. No. 259,429
Int. Cl. B41m 5/26
U.S. Cl. 117—36.7 6 Claims

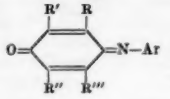
1. A thin sheet of material for indicating temperature differentials comprising an elastic membrane of material having imbedded as a layer therein an intimate mixture of encapsulated particles of a cholesteric liquid crystalline material exhibiting differential surface reflection of light dependent upon the temperature thereof and to particles of a material which is incompressible relative to said encapsulated particles, said incompressible particles being larger in size than said encapsulated particles to protect the latter from compressive stress within said film; said encapsulated particles of a cholesteric material each including a central body which is light absorptive at its surface, a layer of said cholesteric material overlying the exposed light absorptive surface of said body, and a protective layer of a light transparent material for isolating said cholesteric material from the external environment surrounding said body and said layer of cholesteric material thereon.

3,852,093
HEAT-SENSITIVE COPY-SHEET

Kevin P. O'Leary, Minneapolis, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Dec. 13, 1972, Ser. No. 314,687
Int. Cl. B41m 5/00
U.S. Cl. 117—36.8 7 Claims

1. Colored sheet material capable of undergoing localized loss of color when thermographically heated in presence of a reducing agent and containing a p-quinoneimine color body in a film-forming binder, wherein said color body has the structure

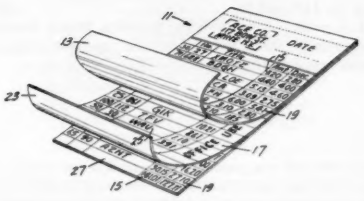


wherein Ar is an aromatic radical and the R, R', R'' and R''' substituent radicals may be hydrogen, halogen, alkyl, alkoxy or amido, or wherein adjacent substituent radicals may constitute a fused polycyclic or heterocyclic ring.

3,852,094
MEANS FOR DESENSITIZING CARBONLESS PAPERS

Dean R. Yarian, Afton, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 110,876, Jan. 29, 1971, Pat. No. 3,809,668. This application Nov. 23, 1973, Ser. No. 418,470
Int. Cl. B41m 5/00; C08g 51/26
U.S. Cl. 117—36.8 4 Claims



1. A printed form comprising a paperlike sheet,
a material present on at least part of a surface of said paperlike sheet, said material being color-reactive with a dye precursor, and
interacted with at least a portion of said material, a complexing agent soluble in organic media and capable of forming a coordination compound with a salt or nickel, copper, cobalt, or cadmium, wherein said complexing agent is capable of forming a complex in said organic media with coreactant salts such that said complex is more stable than complexes of dithiooxamide or derivatives thereof with said metal salts.

3,852,095
METHOD AND APPARATUS FOR APPLYING WAX TO CAN LID RIMS

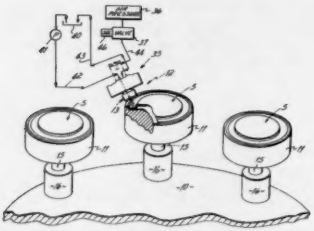
Edwin F. Hogstrom, Sheffield Lake, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Sept. 28, 1970, Ser. No. 76,167
Int. Cl. B05c 1/16; B05b 13/02
U.S. Cl. 117—43 10 Claims

1. The method of applying a 100 percent solids protective layer of wax in the configuration of an annular ring to the rim of a can end without the addition of any solvent so that the end need not be baked to drive off solvent from the wax, which method comprises:

rotating the end relative to the orifice of a nozzle of a spray gun,

melting a 100 percent solids wax and supplying it in the as melted condition to the nozzle of said spray gun without the addition of any solvent,



ejecting said melted wax in the form of a fan-shaped sheet of liquid from said nozzle orifice and directing it onto the rotating end, said end being located sufficiently close to the nozzle orifice that said wax film is applied to the end as an unatomized curtain sheet of wax.

3,852,096

PROCESS FOR FABRICATING AN ARTICLE FROM A MULTIPHASE COPOLYMER COMPOSITION

Robert D. Lundberg, Somerville, and Henry S. Makowski, Scotch Plains, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 25, 1972, Ser. No. 229,487
Int. Cl. B44d *1/092;* **C09d** *3/74*
U.S. Cl. 117—47 H **10 Claims**

1. A process for fabricating an article from a thermoplastic composition, said thermoplastic composition being a multiphase copolymer of the A—B—A, $(A—B)_n$, or

$$\begin{array}{c} —B—B— \\ | \quad | \\ A \quad A \end{array}$$

type, wherein *n* is greater than 1 and wherein polymer blocks, A and B, are each thermoplastic, comprise above about 10 monomer units, and have softening points substantially above 25°C. with B being present in at least about 30 to about 95 percent by weight of the total polymer, which comprises the steps of:

a. suspending said thermoplastic composition in finely divided form in a liquid medium in such amounts that the solids content of the resulting suspension is in the range of from about 15 to about 75 weight percent; said liquid medium being nonvolatile and being capable of plasticizing the B block of said thermoplastic composition near or above the softening point of that block, but no more than 10 weight percent of said liquid medium will be incorporated into said A block;

b. applying said suspension to a surface; and

c. heating said surface to a temperature at least approximately equal to that of the highest softening point of said composition.

3,852,097

PROCESS FOR TREATING SURFACES

William John Owen, Sully; Bryan Ewart Cooper, Bridgend, and Stephen Westall, Barry, Glamorgan, all of Wales, assignors to Dow Corning Limited, London, England

Filed Feb. 8, 1973, Ser. No. 330,560
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 **8 Claims**

1. A process for treating a surface of a solid organic polymer containing less than 12 per cent by weight of hydroxyl radicals and having at least one chemical linkage selected from carbon to hydrogen bonds and olefinically-unsaturated linkages, said process comprising (1) applying to said surface a coating of an organosiloxane having in the molecule at least one unit of the general formula

$$N_2OC.OR'\overset{\overset{R_a}{|}}{Si}O_{\frac{3-a}{2}}$$

and at least one unit of the general formula

$$R''_bSiO_{4-b/2} \qquad (B)$$

wherein each R and each R'' represents a hydrogen atom or a monovalent hydrocarbon or halogenated hydrocarbon radical having less than 19 carbon atoms, R' represents a divalent aliphatic radical having from 1 to 12 inclusive carbon atoms and composed of carbon and hydrogen a is 0, 1 or 2 and b is 1, 2 or 3, there being present in the organosiloxane at least 1 mol percent of (A) units, and (2) exposing the applied organosiloxane to one or more of high energy radiation, ultra violet light and a temperature from 80°C. to just below the decomposition temperature of the organic polymer.

3,852,098

METHOD FOR INCREASING RATE OF COATING USING VAPORIZED REACTANTS

Karl H. Bloss, Dietzenbach-Steinberg, and Harald Molketin, Frankfurt, both of Germany, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 15, 1972, Ser. No. 315,384
Int. Cl. C23c *11/08*
U.S. Cl. 117—106 R **2 Claims**

1. A method of coating a glass substrate with a metal oxide coating comprising the steps of:

a. dispersing a powdered coating reactant having a standard vaporization entropy of at least 40 Clausius and a melting point-to-vaporization point span of less than about 120°C. into a stream of air that is sufficiently hot to vaporize the coating reactant so that a mixture of air and vaporized coating reactant is formed;

b. maintaining the mixture at a temperature above that at which it is saturated with the coating reactant and below that at which the coating reactant pyrolyzes;

c. heating the glass substrate to a temperature sufficient to cause the coating reactant to pyrolyze; and

d. delivering the mixture sufficiently closely to the hot glass substrate to cause the coating reactant to pyrolyze forming a coating on the substrate.

3,852,099

DENSE SILICON CARBIDE CERAMIC AND METHOD OF MAKING SAME

Svante Prochazka, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 27, 1972, Ser. No. 309,676
Int. Cl. C04b *41/24;* **C22c** *29/00*
U.S. Cl. 117—119 **9 Claims**

1. A silicon carbide ceramic body comprising a silicon carbide matrix filled with a composition consisting essentially in weight percent of 55–70 percent of boron carbide, 30–45 percent of silicon carbide and, based on the total weight of the composition, an amount up to 10 percent by weight and at least sufficient to lower the temperature of liquid formation of said composition, of a member selected from the group consisting of silicon metal and aluminum carbide.

3,852,100
TREATMENT OF POROUS SURFACES OF ARTICLES OF MANUFACTURE

Perry A. Argabright, Larkspur; C. Travis Presley, Denver, and John A. Davis, Littleton, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio

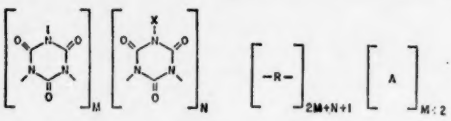
Filed Dec. 26, 1972, Ser. No. 317,883
Int. Cl. C03c *17/00*
U.S. Cl. 117—123 C **4 Claims**

1. In a process for the sealing of porous surfaces of articles of manufacture to reduce their permeability to fluids, the improvement comprising:

a. preparing an aqueous solution containing a water soluble salt of a polyisocyanuric acid and polyvinyl alcohol or hydroxyethyl cellulose,

b. adjusting the pH of said aqueous solution as desired for a given application, always having a pH in excess of **7**, and

c. applying said aqueous solution to said porous surfaces and maintaining contact between said porous surfaces and said aqueous solution for a time sufficient to permit gelation within the void space of said permeable surfaces, wherein said isocyanurate salt has the structure:



wherein

R = divalent hydrocarbon radical

X = a metal, hydrogen, quaternary ammonium or a combination thereof,

A = monovalent group selected from the following: isocyanate, urethane, urea, amino, NH_2CO_2R',

R' = monovalent hydrocarbon radical

M = average number of trisubstituted isocyanurate rings, a positive number from 0 to about 400,

N = average number of isocyanuric acid or derivative rings, a positive number from above 1 to about 10,000,

2M+N+1 = average number of divalent R groups

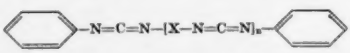
M+2 = average number of A groups.

3,852,101
STABILIZATION OF POLYESTER FIBERS WITH CARBODIIMIDE

David H. Batchelor, Jr., Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 1, 1972, Ser. No. 302,710
Int. Cl. C08g *51/60*; **D06m** *13/38*
U.S. Cl. 117—138.8 F **8 Claims**

1. Filaments composed of at least 85 percent by weight of an ester of ethylene glycol and terephthalate acid having an aliphatic ether concentration of 0–3 mole percent and surface coated with about ½–2 percent, based on the weight of the filaments of a compound having the general structural formula:



where *x* is a radical selected from the group consisting of 2, 4 tolylene, 2, 6 tolylene, and mixtures of the above; and *n* has an average value of about 1.

3,852,102
PERMANENT ANTI-SNAG FINISH FOR FABRICS

James W. Lalk, Shepherd, and Jobie Crear, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

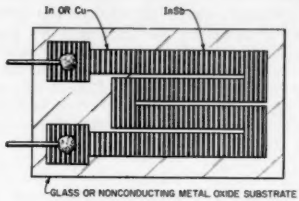
Filed July 26, 1973, Ser. No. 383,024
Int. Cl. C08j *1/44*
U.S. Cl. 117—139.5 A **7 Claims**

1. A method for reducing the snagging of fabrics comprising the application to the fabric of an aqueous latex of a polymer comprising from about 25 to 50 weight percent of a hydroxy lower alkyl acrylate, from about 6 to 12 weight percent acrylonitrile, from about 40 to 60 weight percent of a lower alkyl acrylate having from two to eight carbon atoms in the alkyl group and from about 1 to 5 weight percent acrylic acid wherein said polymer is of a molecular weight to be insensitive to chlorinated solvents and water followed by dewatering the coating and curing the polymer.

3,852,103
RASTER PATTERN MAGNETORESISTORS

David A. Collins, 6234 Pearl Lake Ave., and Harry H. Wieder, 2860 Chatsworth Blvd., both of San Diego, Calif.

Continuation-in-part of Ser. No. 748,069, July 26, 1968, Pat. No. 3,592,708. This application Mar. 1, 1971, Ser. No. 119,978
Int. Cl. B44d *1/18*; **C23b** *5/50*
U.S. Cl. 117—212 **3 Claims**



1. A high sensitivity raster pattern magnetoresistor device whose resistance shows a strong variation with magnetic field, comprising:

a. a non-conducting substrate,

b. an electron beam microzone-crystallized semiconducting thin film having microscopic thickness of from 3 to 5 μm and selected from the group of intermetallic compounds consisting of InSb and InAs in a magnetoresistor pattern formed on said substrate;

c. a high density raster pattern of identical metallic lines of microscopic thickness on the surface of said conducting thin film, said raster pattern of metallic lines together with said semiconducting thin film providing a series-connected array of identical semiconductor parallelipipeds whose thickness is slight with respect to their other dimensions such that the semiconducting film between the metallic lines has a small length to width ratio in the direction of applied current and the width of the metallic lines is identical with the spacing between said lines;

d. said metallic lines being of the order of 0.5 to 2.0 μm in thickness;

e. the initial resistance of said magnetoresistance device being between 10 and 1,000 ohms which resistance increases with an applied magnetic field reaching a value greater than a factor of 10 of the initial resistance in a magnetic field of 10 kOe, said magnetoresistor also having a large surface-to-volume ratio which provides for efficient thermal dissipation of heat from the body of said magnetoresistor to its surroundings.

3,852,104
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

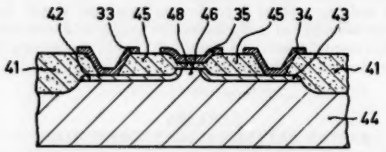
Else Kooi; Reinier De Werdt, both of Eindhoven; Maria Magdalena Mathilda Nijdam-Paffen, Kerkrade, all of Netherlands, and U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1972, Ser. No. 293,782

Claims priority, application Netherlands, Oct. 2, 1971, 7113561

Int. Cl. H01l *7/54*

U.S. Cl. 117—212 **5 Claims**



1. A method of manufacturing a semiconductor device, comprising providing on one side of a semiconductor body a patterned etchant-resistant and oxidation-resistant masking layer, subjecting the semiconductor body to an etching treatment with an etchant which does not substantially attack the masking layer to form recesses in the semiconductor body at the unmasked areas, the semiconductor underetching at the masking layer edges whereby the latter project over the recesses, thereafter removing the masking layer edges which project over the recesses, and thereafter subjecting the masked body to an oxidation treatment with the masking layer in place to form an oxide inset in the body at the recesses, said oxidation treatment being continued until the surface of the grown oxide reaches at least the level of the masking layer.

3,852,105
FABRICATION OF DARK HEATERS

John Richard Hale, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 7, 1972, Ser. No. 242,240

Int. Cl. B44d *1/18*

U.S. Cl. 117—217 **4 Claims**

1. A method of providing a coating on a heater structure comprising:

preparing a substantially rheologically stable bath by dispersing tungsten particles in a liquid vehicle until the apparent specific gravity of said bath, as measured by a hydrometer, is substantially equal to the true specific gravity of the bath taken as a whole, and then

passing said heater into and out of said bath within a period of time in which the difference between the apparent and true specific gravities of said bath is not greater than 5 percent.

3,852,106
POLYAMIDE-IMIDE POLYMER HAVING AN ORDERED STRUCTURE

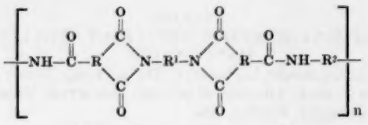
Joseph H. Incremona, Salt Lake City, Utah, and Daniel Strugar, Cherry Hill, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 650,195, June 30, 1967, abandoned. This application July 22, 1969, Ser. No. 843,848

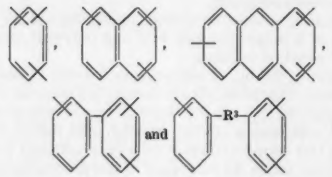
Int. Cl. C08g *20/32*

U.S. Cl. 117—218 **15 Claims**

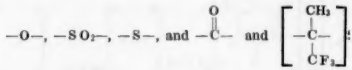
1. A film-forming polyamide-imide polymer having an ordered structure of recurring amide-imide-imide-amide linkages in the polymer chain consisting essentially of the following recurring structural units:



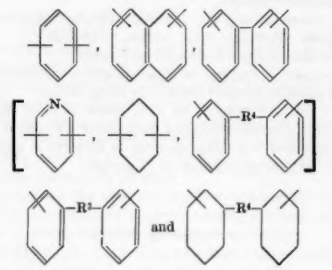
where R is a trivalent aromatic radical selected from the group consisting of



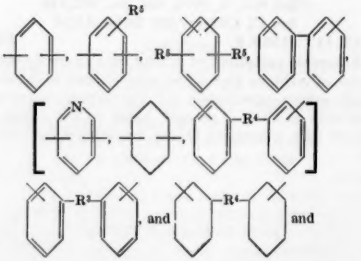
wherein R^3 is selected from the group consisting of an alkylene radical having 1–3 carbon atoms,



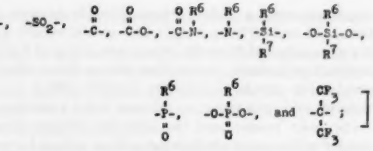
wherein R^1 is a divalent organic radical selected from the group consisting of an alkylene radical having 2–8 carbon atoms,



and R^2 is a divalent organic radical selected from the group consisting of an alkylene radical having 2–6 carbon atoms,



wherein R^4 is selected from the group consisting of an alkylene radical containing 1–3 carbon atoms;



R^5 is an alkyl radical of 1–3 carbon atoms, and n is an integer sufficient to provide a polymer having an inherent viscosity of at least 0.15 and up to 4.0 measured at 27°C. on a 0.5 percent polymer solids solution in dimethylacetamide.

3,852,107

PROTECTION OF GRAPHITE ELECTRODES

Clive Graham Lorkin, Borken, and Josef Schiffarth, Postfach, both of Germany, assignors to Foseco International Limited, Birmingham, England

Filed Nov. 27, 1972, Ser. No. 309,919

Claims priority, application Great Britain, Nov. 26, 1971, 55128/71

Int. Cl. B44d *1/44*

U.S. Cl. 117—228 **13 Claims**

1. In a method of protecting an arc furnace electrode formed of graphite wherein the electrode is held by means of clamps in the arc furnace, the improvement which comprises applying to the electrode a protective coating comprising 15 – 90 percent by weight of matrix material having a melting point of less than 1,000°C and which is a graphite-wetting material, and 10 – 85 percent by weight of a refractory filler, the protective coating being applied over only that part of the electrode which, in use, is below the level of the electrode clamps.

3,852,108

METHOD AND DEVICE FOR RECOVERING GLASS FIBER FROM GLASS FELT REJECTS

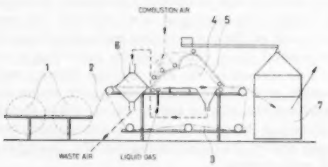
Martin Lindberg, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Aug. 20, 1973, Ser. No. 390,099

Claims priority, application Finland, Sept. 4, 1972, 2440/72

Int. Cl. C03c *23/00*

U.S. Cl. 134—2 **3 Claims**



1. A method for recovering glass fibers from glass mat containing a binding agent dispersed upon glass fibers, which comprises introducing a fuel and air into a combustion zone to maintain a combustive atmosphere therein, preheating the glass mat by conducting exhuast gases from said combustion zone through the mat, conveying the glass mat into said combustion zone, directing the flow of fuel and air into said combustion zone to thereby support the mat in suspension therein, and maintaining the temperature in said combustion zone below the softening temperature of the glass fibers but above the combustion temperature of the binding agent to burn said binding agent away from the glass fibers, and conveying the glass fibers thus separated from the mat out of said combustion zone.

3,852,109

CLEANING MOVING WEBS BY PASSAGE BETWEEN OPPOSED FLEXIBLE POLYURETHANE FOAM WIPERS

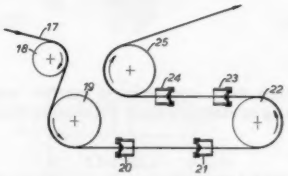
John Norman Cheetham, Ashtead, England, assignor to Yarsley Research Laboratories Limited, Chessington, Surrey, England

Filed May 8, 1973, Ser. No. 358,392

Claims priority, application Great Britain, May 8, 1972, 21365/72

Int. Cl. B08b *1/02, 7/00*

U.S. Cl. 134—9 **12 Claims**



1. A method of cleaning a continuous support web prior to forming a thin polymer film thereon, which comprises the step of passing the support web at a rate of at least 15 feet/minute between at least one pair of dry wipers, one wiper of the pair bearing against one surface of the support web and the other wiper bearing against the other surface and the wipers being formed of a flexible polyurethane foam material.

3,852,110

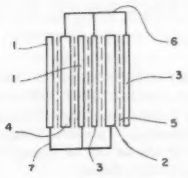
GASTIGHT ALKALINE BATTERY WITH PASTE AND SINTERED ELECTRODE

Siegfried Dickfeldt, Hagen, Germany, assignor to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Oct. 11, 1973, Ser. No. 405,291

Int. Cl. H01m *35/00*

U.S. Cl. 136—6 R **6 Claims**



1. A gastight alkaline battery, comprising positive and negative paste groups each of which comprises both paste and sintered electrodes.

3,852,111

LEAD STORAGE BATTERY CELL

Juergen Brinkmann, Berenbostel, and Gerwin Trippe, Gevelsberg, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Oct. 23, 1973, Ser. No. 408,815

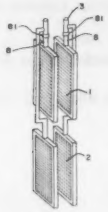
Claims priority, application Germany, Oct. 23, 1972, 2251870

Int. Cl. H01m *35/32*

U.S. Cl. 136—26 **10 Claims**

1. Plate electrode means for storage batteries comprising: a plurality of separate plate segments, spaced from each other and positioned vertically above one another, and

separate current take-off connectors for said respective segments mechanically linking said segments and connecting them electrically in parallel, said connectors having substantially equal electrical resistance.



3,852,112

ACTIVATION OF NICKEL BATTERY PLATES

Trevor Stanley Turner, Kidderminster, and John Edward Whittle, Sutton Coldfield, both of England, assignors to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 107,422, Jan. 18, 1971, abandoned. This application Feb. 8, 1973, Ser. No. 330,695

Int. Cl. H01m *43/04*

U.S. Cl. 136—29 **5 Claims**

1. In a process for activating a solid nickel surface for use as a positive electrode in alkaline storage batteries wherein the said solid nickel surface is anodically treated for at least 5 minutes at an anode current density of about 0.1 to 1000 mA/cm^2 in an aqueous electrolyte at a temperature not exceeding 35°C. which contains in solution ammonia and a nickel salt selected from the group consisting of nickel nitrate, nickel acetate, nickel sulfate and nickel chloride, the ratio of gram-molecules of ammonia to grams-ions of nickel being from 0.1 to 3, whereby a battery active mass of NiO(OH) is deposited on said nickel surface; the improvement for stabilizing the electrolyte comprising adding to the electrolyte an ammonium salt having the same anion as the nickel salt, the ratio of the molar concentration of the ammonium salt to that of the nickel salt being at least 0.1:1 but not exceeding 3:1.

3,852,113

POSITIVE ELECTRODE FOR HIGH ENERGY PRIMARY CELLS AND CELLS USING SAME

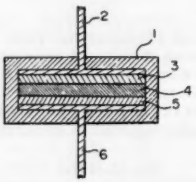
Noriyuki Yokota, Ashiya; Nobuatsu Watanabe, Kyoto; Shingo Tokuda, Nishinomiya; Yasuhiro Kanaya, and Hirokatsu Shimizu, both of Osaka, all of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

Filed Dec. 27, 1972, Ser. No. 318,775

Claims priority, application Japan, Dec. 30, 1971, 46-2595; Apr. 1, 1972, 47-32713; Aug. 8, 1972, 47-79792

Int. Cl. H01m *17/00*

U.S. Cl. 136—83 R **20 Claims**



1. A positive electrode for high energy primary cells which comprises a homogeneous mixture of a finely divided chlorinated amorphous carbon whose chloride content ranges between 20 and 80% by weight and an electrically conductive material selected from the group consisting of finely divided conductive carbons, conductive carbon fibers, finely divided conductive metals, conductive metallic fibers and mixtures thereof, said homogeneous mixture being bonded with a synthetic resin binder, and the chlorine content of said finely divided chlorinated amorphous carbon ranges between 5 and 70% by weight of the positive electrode.

3,852,114

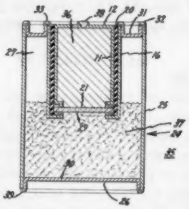
CELL CASING AND HERMETICALLY SEALED PRIMARY SODIUM-SULFUR CELL

Robert R. Dubin, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,375

Int. Cl. H01m *21/14*, *1/00*

U.S. Cl. 136—83 T **4 Claims**



1. A battery casing comprising a first inner metallic casing with a closed end, a fill opening, and an opposite open end, a first inwardly extending metallic flange affixed to the open end of the first inner casing, a second inner metallic casing with opposite open ends, the second inner casing surrounding the first inner casing and spaced therefrom, a second inwardly extending metallic flange affixed to one open end of the second inner casing adjacent to the first flange and spaced therefrom, a layer of electrical insulation positioned between the two inner casings and filling the space therebetween, a solid sodium ion-conductive material disc positioned between the adjacent flanges of the inner casings, low temperature melting glass seals sealing the adjacent flanges to the disc at its periphery, an outer metallic casing comprising a side wall, a removable closed end, and an opposite open end, the side wall of the outer casing surrounding at least partially the inner casings, the side wall of the outer casing extending beyond the flange of the second inner vessel thereby providing a chamber between one surface of the disc and the interior surface of the removable end of the outer casing, the outer casing being spaced from the second inner casing, and a metallic annular ring affixed to the outer casing and the second inner casing at the open end of the outer casing thereby closing the open end of the outer casing.

3,852,115

PRIMARY CELL CASE

Richard W. Lewis, E. Grinstead, and Richard J. Lines, Maidenhead, both of England, assignors to Timex Corporation, Waterbury, Conn.

Continuation of Ser. No. 107,390, Jan. 18, 1971, abandoned. This application Jan. 15, 1973, Ser. No. 323,663

Int. Cl. H01m *1/02*

U.S. Cl. 136—111 **4 Claims**

1. A button type of energy cell for timepieces comprising a case containing active anode and cathode materials, said case comprising:

a can-like member having a base and free-standing side walls extending substantially vertically upward from said

base and defining an opening to receive said cathode material,

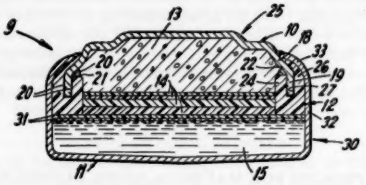
a top cap to receive said anode material, said cap having a top protruding contact portion and a descending flange portion extending downwardly and outwardly at an oblique angle from the horizontal and terminating in a vertically descending end portion,

separating means for separating said anode material from said cathode material,

said separating means comprising a plurality of separator plates positioned within an annular flexible sealing grommet, and

a plurality of barrier plates positioned within said can and the peripheral edges of said barrier plates in contact with the free-standing walls of said can, the periphery of said barrier plates underlying a base portion of said grommet and thereby supporting said grommet and separating said base portion of said grommet and the plurality of said separators from said cathode material in said can-like member,

said annular flexible sealing grommet consisting essentially of said base portion and an inner upwardly extending leg and an outer upwardly extending leg, said pair of spaced



upwardly extending legs defining a slot therebetween, said inner leg being shorter than said outer leg, a shoulder formed at the upper end of said inner leg, said shoulder being spaced from the lower surface of said descending flange portion of said top cap,

the edges of said plurality of separator plates abutting the inner wall of said grommet forming said inner leg and base portion of said grommet, and

an adhesive disposed in the space between said descending flange portion and said shoulder of said interior wall of said grommet and forming a seal therebetween and adhering the descending flange portion of said top cap to said shoulder, and adhesive disposed between the surfaces of said vertically descending end portion and the walls of said slot thereby adhering said end portion and said walls together, and

a swagged portion of said free-standing wall of the can-like member swagged to compress the outer upwardly extending leg of said grommet between said swagged portion and the descending flange portion of said top cap to thereby seal said cell, the leakage path of said seal having been substantially lengthened by the cooperation of the slotted grommet and the associated top cap.

3,852,116
STABILIZATION OF NICKEL BORIDE CATALYST IN POTASSIUM HYDROXIDE ELECTROLYTES

Stuart G. Meibuhr, Birmingham, and Edward J. Zeitner, Jr., Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

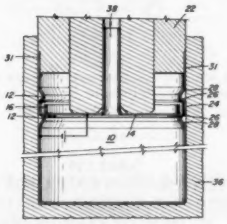
Filed Sept. 25, 1972, Ser. No. 291,584
Int. Cl. H01m *13/00*
U.S. Cl. 136—120 FC **3 Claims**

1. In the method of making fuel cell electrodes for use in an aqueous potassium hydroxide electrolyte including the principal step of depositing fine particles of nickel boride catalyst on an electrically conductive support, the improvement comprising heating said catalyst in the presence of oxygen to a temperature of about 70°C. to about 110°C. for a period of at least about three-quarters of an hour to less than about two hours to retard the rate of decay of the electrode on continued contact with the electrolyte.

3,852,117
SEAL FOR ELECTROCHEMICAL CELLS AND THE LIKE

Anthony Vincent Fraioli, Essex Fells, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 18, 1970, Ser. No. 38,387
Int. Cl. H01m *1/02*
U.S. Cl. 136—133 **1 Claim**



1. A method of sealing a cylindrical battery case which comprises a metal wall which is a hollow cylinder, said method comprising the steps of

a. forming two spaced apart circumferential indentations spaced apart longitudinally in said metal cylinder wall, each of said indentations comprising a longer section and a shorter section of said cylinder wall inclined inwardly from regular sections of said cylinder wall adjacent said indentation and joined at a concentric circle inside said cylinder, the said shorter member of each of said indentations extending inward from an intermediate regular section of said cylinder wall separating said indentations;

b. positioning a circular closure plate concentrically inside said cylinder between said two indentations and

c. deforming said indentations by compressive force transmitted through said cylinder wall to deform said circumferential indentations and forming thereby two inwardly extending members of said cylinder wall, each of such members approximating the shape of a frustrum of a hollow right angle cone joined at the larger base of said frustrum to a regular section of said cylinder wall and extending inwardly to the smaller base of said frustrum which provides a circular sealing edge inside said cylinder bearing against one face of said closure plate, the respective said sealing edges of said two members each bearing against one of the opposed faces of said closure plate.

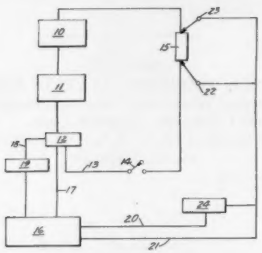
3,852,118
THERMOELECTRIC COMPOSITION

Edward F. Hampl, Jr., Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 36,145, May 11, 1970, abandoned. This application Apr. 7, 1972, Ser. No. 242,219
Int. Cl. H01v *1/18*
U.S. Cl. 136—238 **3 Claims**

1. In a thermoelectric generator, an N-type thermoelectric leg, at least a section of which consists essentially of a cast alloy composition of at least four ingredients reacted together while in melted castable form and selected from the group consisting of silver, copper, tellurium, selenium, and sulfur in proportions, such that the total of silver and copper is in excess of 66⅔ atomic percent and less than 67.7 atomic percent of the composition, with copper being present in an

amount between 0.1 and 5 atomic percent of the composition; sulfur is present in an amount between 0 and 5 atomic percent of the composition; and the balance of the composition is



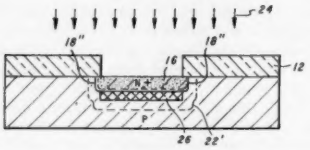
tellurium and selenium in proportions such that the ratio of the atomic percent of tellurium in the composition to the atomic percent of selenium is about 60:40.

3,852,119

METAL-INSULATOR-SEMICONDUCTOR STRUCTURES HAVING REDUCED JUNCTION CAPACITANCE AND METHOD OF FABRICATION

William Milton Gosney, Richardson, Tex., and Martin George Buehler, Gaithersburg, Md., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 14, 1972, Ser. No. 306,505
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 **7 Claims**



1. In a process for fabricating a metal-insulator-semiconductor structure having at least one p-n junction extending from a surface of a semiconductor substrate and characterized by relatively low capacitance, the steps of:

a. forming a mask on the surface of a semiconductor substrate of one conductivity type, said mask defining an aperture exposing a first region of said substrate;

b. introducing doping impurities of opposite conductivity type through said aperture into said first region to form in said substrate, a pocket of said opposite conductivity type having a bottom boundary substantially parallel to said surface and side walls substantially perpendicular to said surface so that said pocket defines a p-n junction with said substrate extending along said boundary and is characterized by a space-charge region defined by the relative doping levels of said pocket and said substrate, and

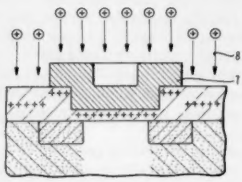
c. introducing doping impurities into said substrate only into a second region adjacent to said bottom boundary of the pocket, said impurities being introduced in quantity sufficient to produce at least partial conductivity type compensation of said substrate material in said second region and thereby reduce the capacitance of said p-n junction by reducing the width of said space-charge region along said bottom boundary while leaving the width of said space-charge region along said lateral boundary substantially unchanged.

3,852,120

METHOD FOR MANUFACTURING ION IMPLANTED INSULATED GATE FIELD EFFECT SEMICONDUCTOR TRANSISTOR DEVICES

William S. Johnson, Hopewell Junction, and San-mei Ku, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1973, Ser. No. 364,800
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 **7 Claims**



1. A method for ion implanting the dielectric layer on an insulated gate field effect transistor comprising implanting ions selected from the group consisting of hydrogen and helium to a dose of between 10^{10} to 10^{14} per square centimeter and annealing the implanted device at a temperature of between 200° – 750° C, whereby mobile ion contamination due to alkaline metal ions and in particular sodium in said dielectric layer is substantially eliminated and suppressed.

3,852,121

PROCESS FOR MAKING A NOVEL COPPER BASE ALLOY

Jacob Crane, Woodbridge; Sam Friedman, Hamden, and Michael Joseph Pryor, Woodbridge, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 268,485, July 3, 1972, Pat. No. 3,816,109. This application Sept. 20, 1973, Ser. No. 399,073
Int. Cl. C22f *1/08*
U.S. Cl. 148—2 **8 Claims**

1. A method of preparing copper alloys consisting essentially of about 0.8–2.3% iron and about 0.3–1.7% cobalt, such that the amount of iron plus cobalt ranges from about 1.5 to 2.5%, from 5 to 13% zinc and the balance essentially copper, to provide improved strength, bend properties, and electrical properties which comprises:

a. hot rolling the alloy at a temperature of at least 500°C, but below its melting temperature; and

b. cold rolling to at least 50% cold reduction wherein said cold rolling includes successive cold reductions and at least one interanneal conducted therebetween at temperatures ranging from about 400 to 600°C for a period of at least 15 minutes.

3,852,122

METHOD OF PRODUCING A WELDABLE AND AGEABLE ALUMINIUM ALLOY OF GREAT STRENGTH AND PRODUCT

Aksel Ola Aarflot; Fred Rudi, both of Sunndalsora; Gunnar Birger Sorensen, Asker; Bjarne Alvsaker, Holmestrand, and Otto Berg, Oslo, all of Norway, assignors to A/S Ardal og Sunndal Verk, Oslo, Norway

Filed Mar. 5, 1973, Ser. No. 338,183
Claims priority, application Norway, Mar. 10, 1972, 778/72
Int. Cl. C22f *1/04*
U.S. Cl. 148—3 **4 Claims**

1. A weldable, heat-treatable aluminium alloy consisting essentially of from 4.5 to 5.8% zinc, from 1.0 to 1.8% magnesium, from 0.10 to 0.30% zirconium, from 0 to 0.30% iron,

from 0 to 0.15% silicon, from 0 to 0.25% manganese, less than 0.05% each of other elements, the sum of these other elements not exceeding 0.15%, and the balance being aluminium, which alloy comprises metastable precipitates of zirconium aluminide having a particle size less than 2000 A uniformly distributed in the alloy in an amount greater than 10^{10} per mm^3.

3,852,123
SEALING RINSES FOR PHOSPHATE COATINGS ON METAL

Kurt Goltz, Exton, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 20, 1972, Ser. No. 308,072
Int. Cl. C23c *3/00*
U.S. Cl. 148—6.14 **16 Claims**

1. The process of sealing a phosphate coated metal comprising wetting the phosphate coated metal by contacting it for a period ranging from about 1 second to about 1 hour with an aqueous solution having a temperature ranging from ambient temperature to about 200°F. of one or more aluminum polymers having a concentration of at least about 0.25 grams per liter of aluminum and selected from the group consisting of aluminum nitrate polymer, aluminum lactate polymer, aluminum formate polymer, aluminum oxalate polymer, aluminum chloride polymer, aluminum perchlorate polymer and aluminum iodide polymer, said aluminum polymers being prepared by slowly adding one mole of aluminum hydroxide gel to one mole of the particular monobasic acid or acid salt desired, and then drying the wetted metal without rinsing.

3,852,124
DUPLEX SEALING PROCESS

Wayne M. Fassell, Newport Beach, Calif., assignor to Philco-Ford Corporation, Blue Bell, Pa.

Filed Sept. 22, 1972, Ser. No. 291,249
Int. Cl. C23c *1/10;* **C23f** *7/08;* **C23b** *5/50*
U.S. Cl. 148—6.15 **10 Claims**

1. A process for improving the corrosion resistance of an anodized aluminum coating of an aluminum based article comprising:

a. contacting said anodized coating with a first aqueous solution of salt selected from the group consisting of acetates, propionates, sulphates, chlorides, bromides, iodides and nitrates, which salt disassociates in water to form a divalent cation selected from the group consisting of iron, cobalt, nickel, lead, magnesium, zinc, cadmium, barium, calcium, copper, manganese, strontium and tin;
b. rinsing said anodized coating; and
c. contacting said anodized coating with a second aqueous solution of a sodium, potassium or ammonium salt which disassociates in water to form an anion selected from molybdate, acid phosphate, phosphate, chromate, dichromate, silicate and chlorate.

3,852,125
SURFACE CONVERSION TREATED MAGNESIUM

James A. Brown, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

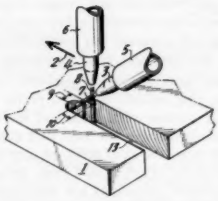
Continuation-in-part of Ser. No. 192,558, Oct. 26, 1971, Pat. No. 3,784,417, which is a continuation-in-part of Ser. No. 89,130, Nov. 12, 1970, abandoned. This application Aug. 2, 1973, Ser. No. 385,114
Int. Cl. C23f *7/16*
U.S. Cl. 148—6.15 R **22 Claims**

1. A magnesium body having a surface layer formed by treating at least a portion of the magnesium surface with an aqueous composition comprising a water solution of about 9.4 to about 19.5 grams per liter NH_4^+; about 50 to about 103 grams per liter PO_4^{---}; about 1.0 to about 2.8 grams per liter Ca^{++}; and a total of about 1.9 to about 4.8 grams per liter of ions selected from the group consisting of Cl^-, NO_3^-, and SO_4^{--}; the composition being characterized by a pH of about 3.0 to about 4.5.

3,852,126
GAS CUTTING METHOD

Hiromichi Yaguchi, Kameo Tachibana, and Tetsuo Matsumoto, all of Tamanoshi, Okoyama, Japan, assignors to Mitsui Shipbuilding & Engineering Co. Ltd., Tokyo, Japan

Filed Aug. 11, 1972, Ser. No. 279,840
Claims priority, application Japan, Aug. 27, 1971, 46/65755; Sept. 30, 1974, 46/76535
Int. Cl. B23k *7/00*
U.S. Cl. 148—9 R **7 Claims**

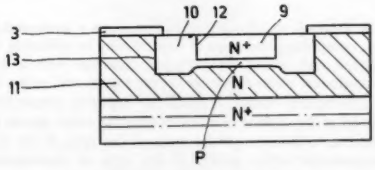


1. A method of gas cutting a metal plate with two nozzles, each of which is adapted to project a jet of oxygen, the first of said jets performing an idle cut and the second of said jets performing a finish cut, the cutting being performed by advancing said nozzles along a line in a selected direction of cutting, the improvement comprising the steps of projecting said first jet from its nozzle at a selected delay angle relative to the cutting direction to thereby impinge said first jet against said plate at said selected angle, projecting said second jet against said plate alongside the path of the first jet so that the cutting slots produced by said jets overlap laterally, and positioning said idle cutting nozzle behind said finish cutting nozzle in the line of cutting so that the jet from said idle cutting nozzle projects past the finish cutting jet prior to impinging against the plate in the line of cutting without contacting the finish jet with the idle jet whereby said idle cutting jet impinges against the plate no more than several millimeters in the direction of cutting in front of the point where the finish cutting jet impinges against the plate.

3,852,127
METHOD OF MANUFACTURING DOUBLE DIFFUSED TRANSISTOR WITH BASE REGION PARTS OF DIFFERENT DEPTHS

Jack Stewart Lamming, Garston, Watford, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 27, 1966, Ser. No. 568,314
Claims priority, application Great Britain, July 30, 1965, 32843/65
Int. Cl. H01l *7/44*
U.S. Cl. 148—187 **3 Claims**



1. A method of manufacturing a transistor, comprising providing a body having at least a semiconductive part of silicon containing a substantially uniform concentration of one type of conductivity-type-determining impurities and a

plane surface, forming on the said plane surface an adherent protective insulating layer, providing a first opening in the insulating layer to form a first exposed limited portion of said plane surface of said body part, diffusing into said first exposed surface portion said one type impurities having a relatively slow rate of diffusion therein and in quantities yielding a relatively high diffused concentration, thereafter forming in the insulating layer a second opening larger than the first opening to form a second exposed limited portion of said plane surface of said body part, and diffusing into said second exposed surface portion conductivity-type-determining impurities of the opposite type having a relatively high rate of diffusion in the body part but in quantities yielding a relatively lower diffused concentration until the opposite type impurities penetrate into said body part to a greater depth than said one type diffused impurities forming a first p-n junction with the initial body part and a second p-n junction with the body part containing the diffused one type impurities, said insulating layer being impervious to both diffused one type and opposite type impurities, said second exposed plane surface portion having a greater surface area than and including and completely surrounding on all sides said first exposed plane surface portion, whereby the later diffused opposite type impurities which traverse a region of said body part which contains the one type diffused impurities are selectively retarded and penetrate to a lesser depth than those which traverse surrounding regions free of said one type diffused impurities and thus the part of the first p-n junction underneath the first exposed portion lies less deeply in the body than the parts of the first junction in surrounding portions.

3,852,128

METHOD OF DIFFUSING IMPURITIES INTO SEMICONDUCTOR WAFERS

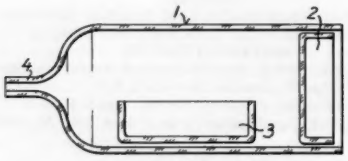
Karl-Heinz Kreuzer, Heilbronn, Germany, assignor to Licentia, Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Continuation of Ser. No. 12,011, Feb. 17, 1970, abandoned. This application Apr. 17, 1972, Ser. No. 244,961

Claims priority, application Germany, Feb. 22, 1969, 1909030

Int. Cl. H01l 7/44

U.S. Cl. 148—189 **10 Claims**



1. A method of diffusing impurities into a semiconductor wafer, comprising the steps of determining by diffusing in an exhausted and sealed off diffusion chamber with a doped semiconductor wafer means as doping source and under diffusion parameters otherwise fixed the impurity concentration achieved at the surface of a semiconductor wafer means to be diffused as a function of the ratio of the area of the doped semiconductor wafer means to the area of semiconductor wafer means to be diffused, selecting a desired impurity concentration for a given semiconductor wafer means to be diffused, and diffusing impurities into said given wafer means under the fixed diffusion parameters used in the step of determining and at the appropriate ratio determined in the step of determining.

3,852,129

METHOD OF CARRYING OUT DIFFUSIONS WITH TWO SOURCES

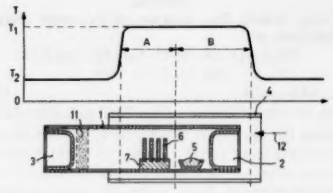
Daniel Diguet, Herouville-St.-Clair, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 29, 1973, Ser. No. 346,081

Claims priority, application France, Apr. 5, 1972, 72.11912

Int. Cl. H01l 7/44

U.S. Cl. 148—189 **9 Claims**



1. A method of diffusing doping material in a semiconductor body in which the doping material is transported to the said body via the vapour phase from a doping source and in which the said source and the body are heated in a space, characterized in that the said space comprises three regions, namely a central region in which the said body is placed and two end regions which are present on either side of the said central region and which are destined for at least two sources of the same doping material but of different composition and that the said space in a first phase is arranged so that the said body and a single doping source are present in a zone of high temperature, after which the space is moved relative to the heating means and, in a second phase, the said body and only a second doping source are held in the said zone of high temperature.

3,852,130

Patent Not Issued For This Number

3,852,131

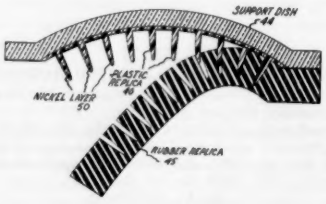
METHOD OF MANUFACTURING X-RAY IMAGE INTENSIFIER INPUT PHOSPHOR SCREEN

John M. Houston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 254,100, May 17, 1972, Pat. No. 3,783,299. This application July 19, 1973, Ser. No. 380,845

Int. Cl. C23f 1/02; H01j 31/49

U.S. Cl. 156—3 **7 Claims**



1. A method for manufacturing an improved x-ray image intensifier input phosphor screen comprising the steps of forming an electrically conductive plastic replica having wall-like projections forming a waffle-like surface on a first major side thereof and a smooth surface on a second major side,

forming a thin, relatively high reflectivity metal layer on the waffle-like surface of the plastic replica,

dissolving the plastic material thereby leaving a thin metal replica having wall-like projections forming a waffle-like surface on a first major side thereof and the second major side having indentations corresponding to the wall-like projections on the first side,

transferring the metal replica to the face plate of an x-ray image intensifier tube, and positioning the metal replica on the inner surface of the face plate,

firmly attaching the metal replica to the face plate,

depositing a phosphor layer on the waffle-like surface of the metal replica to a thickness wherein the phosphor layer extends slightly beyond the ends of the wall-like projections,

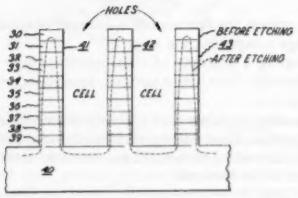
smoothing the outer surface of the phosphor layer to obtain a surface substantially parallel to the inner surface of the face plate, and

depositing a thin uniform coating of a photoemitter material on the outer surface of the phosphor layer.

3,852,132
METHOD OF MANUFACTURING X-RAY IMAGE INTENSIFIER INPUT PHOSPHOR SCREEN

John M. Houston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 254,099, May 17, 1972, Pat. No. 3,783,298. This application July 19, 1973, Ser. No. 380,844
Int. Cl. C23f 1/02; H01j 31/49
U.S. Cl. 156—3 **6 Claims**



1. A method for manufacturing an improved x-ray image intensifier input phosphor screen comprising the steps of

forming a silicone resin-granular phosphor replica having solid wall-like projections forming a waffle-like surface on a first major side thereof and a smooth surface on a second major side conforming to the concave-shaped inner surface of a face plate of an x-ray image intensifier tube,

firmly attaching the silicone resin-granular phosphor replica to the face plate of the x-ray image intensifier tube wherein the smooth surface of the replica is attached to the concave-shaped inner surface of the face plate,

depositing a transparent phosphor layer on the waffle-like surface of the silicon resin-granular phosphor replica to a thickness wherein the phosphor layer extends slightly beyond the ends of the wall-like projections,

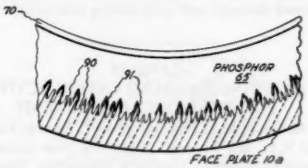
smoothing the outer surface of the phosphor layer to obtain a surface substantially parallel to the concave-shaped inner surface of the face plate, and

depositing a thin uniform coating of a photoemitter material on the outer surface of the phosphor layer.

3,852,133
METHOD OF MANUFACTURING X-RAY IMAGE INTENSIFIER INPUT PHOSPHOR SCREEN

John M. Houston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 254,065, May 17, 1972, Pat. No. 3,673,438. This application July 19, 1973, Ser. No. 380,846
Int. Cl. C23f 1/02; H01j 31/49
U.S. Cl. 156—3 **10 Claims**



1. A method for manufacturing an improved X-ray image intensitifer input phosphor screen comprising the steps of

forming a waffle-like surface along the concave-shaped major side of a face plate of an X-ray image intensifier tube wherein the waffle-like surface has light-reflective floor portions and rib-like projections extending outward therefrom,

coating the rib-like projections with a light-absorbing material,

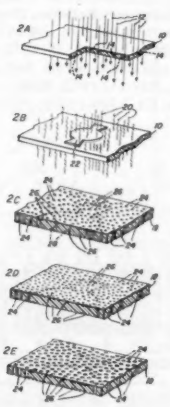
depositing a phosphor layer on the waffle-like surface to a thickness wherein the phosphor layer extends substantially beyond the ends of the rib-like projections, and

depositing a thin uniform coating of a photoemitter material on the outer surface of the phosphor layer.

3,852,134
METHOD FOR FORMING SELECTIVELY PERFORATE BODIES

Charles P. Bean, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 821,703, May 5, 1969, abandoned. This application Nov. 20, 1972, Ser. No. 308,158
Int. Cl. G01t 5/00
U.S. Cl. 156—8 **3 Claims**



1. A method of perforating a solid body in a predetermined pattern comprising subjecting said body to a homogeneous bombardment of charge particles having an energy level form-

ing damage tracks extending through said body, exposing a selective portion of said homogeneously bombarded body in an oxygen containing ambient to radiant energy for a period required to alter the solubility rate of said exposed damage tracks, etching said body for a period sufficient to etch through those damage tracks lying within the selectively exposed portion of said body, said etch period being insufficient to etch through damage tracks lying outside said exposed portion of said body, annealing the selectively perforate body for a period required to obliterate the altered solubility of said damage tracks and etching said body to enlarge the perforations formed through said body during said initial etch of said body.

3,852,135

PATCHING DAMAGED CATION-ACTIVE PERMSELECTIVE DIAPHRAGMS

Edward H. Cook, Jr., Lewiston; Alvin T. Emery, Youngstown, both of N.Y., and Blaine O. Schoepfle, New Canaan, Conn., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 212,171, Dec. 27, 1971,. This application Aug. 9, 1973, Ser. No. 387,072

Int. Cl. B32g *35/00*

U.S. Cl. 156—94 **13 Claims**

1. A process for repairing damaged sections of a hydrolyzed copolymer of a perfluorinated hydrocarbon containing from two to five carbon atoms and a fluorosulfonated perfluorovinylether which comprises

a. forming a solution of a second hydrolyzed copolymer of a perfluorinated hydrocarbon containing from 2 to 5 carbon atoms and a fluorosulfonated perfluorovinyl ether, said second copolymer having a lower equivalent weight than said damaged copolymer in a lower hydrocarbon alkanol,

b. wetting the area adjacent to the damaged area of the damaged copolymer,

c. covering the wetted area with a patch of hydrolyzed copolymer of the same equivalent weight as that of said damage copolymer and

d. removing the lower alkanol solvent from the covered area.

3,852,136

PRODUCTION OF LAMINATED GLAZING

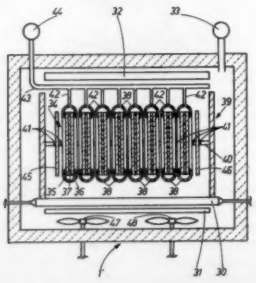
Emile Plumat, Gilly; Robert Van Laethem, Loverval; Pierre Colignon, Charleroi; Michel Wasterlain, Trazegnies, and Pierre Votquenne, La Louviere, all of Belgium, assignors to Glaverbel S.A., Watermael-Boitsfort, Belgium

Continuation-in-part of Ser. No. 148,401, June 1, 1971, abandoned. This application Aug. 25, 1972, Ser. No. 283,792

Claims priority, application Great Britain, Dec. 8, 1971, 57079/71; Belgium, July 11, 1972, 4190

Int. Cl. B32b *17/10, 31/20*

U.S. Cl. 156—103 **24 Claims**



1. In a process of forming a laminate by heating an assembly including at least two sheets of glass or vitrocrystalline material and an intervening thermoplastic layer, to at least soften the thermoplastic layer, and applying pressure to and heating the assembly sufficiently to firmly bond the sheets by means of such thermoplastic layer, the improvement prior to the step of applying pressure to and heating the assembly, comprising the steps of: simultaneously applying a sub-atmospheric environmental pressure to the assembly and heating the assembly to soften the thermoplastic layer and applying along the margins of the assembly a sub-atmospheric pressure which is lower than the sub-atmospheric environmental pressure applied to the assembly, whereby the intersheet spaces are subjected to suction.

3,852,137

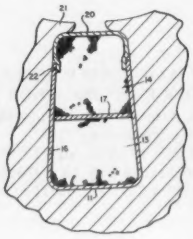
CHANNEL SHAPED LAMINATED HIGH TEMPERATURE SLOT WEDGE FOR DYNAMOELECTRIC MACHINES

Roy Leonard Balke, and Domenico Cipriani, both of Erie, Pa., assignors to General Electric Company, Wilmington, Mass.

Division of Ser. No. 133,820, April 4, 1971, Pat. No. 3,735,169. This application Sept. 18, 1972, Ser. No. 290,095

Int. Cl. B31f *7/00*

U.S. Cl. 156—196 **1 Claim**



1. A process for fabricating a channel-shaped, laminated, slot wedge comprising the steps of:

1. Coating a plurality of thin, resilient, high temperature polyimide films with a curable, epoxylated, novolac, resin adhesive;

2. Pressing together said plurality of polyimide films, said polyimide films having their contacting surfaces coated with the uncured epoxylated novolac resin adhesive to form a flat laminate,

3. Forcing the laminate and the as yet uncured adhesive into the desired channel shape,

4. Heating the laminate for a period of three hours at a temperature in the range of 160°–165°C to cure the epoxylated novolac resin adhesive which the laminate is held in the said channel-shape whereby the adhesive becomes rigid and the resilient films are retained in the desired channel configuration.

3,852,138

METHOD OF MAKING FOLDS IN COATED FIBER CONTAINERS

James Leslie Deuel, Long Grove, Ill., assignor to American Can Company, Greenwich, Conn.

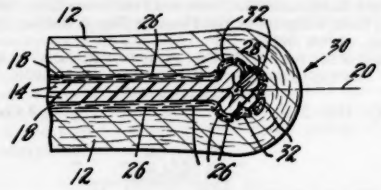
Filed Nov. 13, 1972, Ser. No. 305,727

Int. Cl. B31f *1/00*

U.S. Cl. 156—227 **4 Claims**

1. A method of making folds in a coated fiber container produced from a fiberboard layer having an impervious coating pre-laminated to a surface of the fiberboard layer which forms the interior of the container, the impervious coating penetrating the surface of the fiberboard layer thereby cohesively bonding the fibers in an intermediate layer at the surface of the fiberboard layer together, the method including inversely pre-folding the laminate thereby weakening, distort-

ing, and breaking the surface fibers in the fiberboard layer which have been stiffened by the penetration of the coating



material, and folding said laminate along the same fold lines so that the fiberboard layer is folded upon itself and only the impervious coating is exposed at the extremity of the folds.

3,852,139

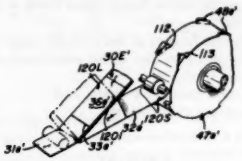
METHOD OF DISPENSING LABELS

William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 206,061, Dec. 8, 1971, Pat. No. 3,783,038, which is a continuation-in-part of Ser. No. 155,740, June 23, 1971, abandoned. This application June 4, 1973, Ser. No. 366,918

Int. Cl. B32b *3/10*

U.S. Cl. 156—250 **2 Claims**



1. Method of dispensing labels, comprising the steps of: providing a plurality of labels releasably secured by pressure sensitive adhesive to a web of supporting material, the web having spaced apart groups of cuts disposed within the edges of the web, each group of cuts comprising at least two cuts spaced apart by a frangible portion, one of the cuts of each group providing a feed edge, causing the web to undergo a sharp change in direction at a delaminating zone where the labels are successively delaminated from the web, guiding the delaminated part of the web into cooperation with a toothed driver, severing the frangible portion by advancing a tooth of the toothed driver into engagement with the feed edge, and pulling on the delaminated part of the web by continuing the advance of the toothed driver to effect delamination of a label at the delaminating zone.

3,852,140

METHOD OF MAKING COMPOSITE WEB OF LABELS

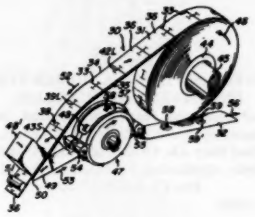
William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 206,061, Dec. 8, 1971, Pat. No. 3,783,083, which is a continuation-in-part of Ser. No. 155,740, June 23, 1971, abandoned. This application June 4, 1973, Ser. No. 366,826

Int. Cl. B32b *31/18, 3/10, 3/16*

U.S. Cl. 156—253 **2 Claims**

1. Method of making a composite web of labels, comprising the steps of: providing label material on a web of supporting material, pressure sensitive adhesive releasably securing the label material to the supporting material, severing only the label material transversely to provide a plurality of labels carried by the web of supporting material, simultaneously cutting both the label material and the supporting material to foam spaced apart groups of aligned cuts through both the label material and the supporting material, the cuts in the label material rendering the label more difficult to remove when applied to merchandise and the cuts in the supporting material facilitating advance of the composite web, each group of cuts formed during the cutting step including a cut through the supporting material web defining a feed edge and at least one



other cut through the supporting material web spaced from the feed edge to provide a frangible portion, the frangible portion preventing a hole from being formed and preventing accompanying flap portions from being folded out of the plane of the supporting material web upon delamination of the labels but when an advancing tooth of a driver engages the supporting material web at one group of cuts the tooth will cause the frangible portion of the supporting material web to be severed to form a hole in the supporting-material web so that the tooth can engage the feed edge to advance the composite web.

3,852,141

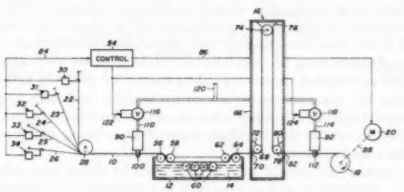
STRAND CLAMPING APPARATUS FOR AUTOMATIC KNOCK OFF SYSTEM

Christopher G. Cross, Forest City, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 11, 1972, Ser. No. 313,911

Int. Cl. B23b *31/00;* **B65h** *63/02;* **B05c** *11/00*

U.S. Cl. 156—351 **11 Claims**



1. In an automatic knock-off system for use with a fiber glass coating apparatus,

a source of supply for a plurality of glass filaments,

means for forming said plurality of filaments into a single strand,

means for feeding said single strand through said coating apparatus,

motor driven winder means for wrapping said single strand onto a package after the single strand has been coated,

clamp means responsive to a discontinuity in any one of said plurality of filaments for grasping said single strand on both sides of said coating apparatus to thereby hold said

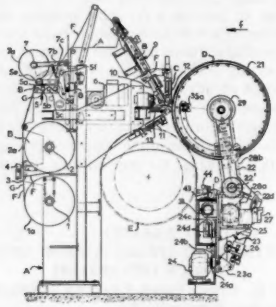
single strand taut in said apparatus, said clamp means including first and second strand holders, said strand holders being actuable sustantially simultaneously to grasp said strand and each including therein mechanically movable strand gripping means around said single strand and biased to allow free movement of said single strand and actuator means for said clamp means for moving each said strand gripping means into contact with said single strand to grasp and hold said strand.

3,852,142

APPARATUS FOR APPLYING A RUBBER STRIP ONTO A PNEUMATIC TIRE CARCASS

Jean Rene Leblond, and Jean Armand Biet, both of Compiegne, France, assignors to Uniroyal, Clarioix, France

Filed May 22, 1972, Ser. No. 255,488
Claims priority, application France, June 3, 1971, 71.20233
Int. Cl. B29h *17/20*
U.S. Cl. 156—395 **17 Claims**



1. An apparatus for applying a rubber strip of a desired length to a pneumatic tire carcass mounted on a tire building drum, said apparatus comprising means for supplying said strip to an application means; application means for receiving said strip and for winding said strip on a transfer drum located at a first position adjacent said application means, said transfer drum having an outer surface to which said strip adheres, said application means including means for pressing said strip onto the transfer drum; means for cutting said strip to a desired length corresponding to the circumferential length of the carcass on the tire building drum after winding said strip on the transfer drum;

means for axially moving the transfer drum and said adhered strip to a second position adjacent the tire-building drum; means for radially moving the transfer drum and said adhered strip into tangential rotational contact with said tire-building drum;

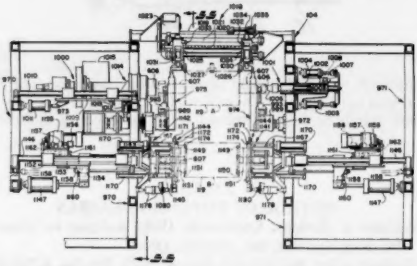
means for locking the transfer drum in a plurality of desired rotational positions, said locking means including a plurality of engageable elements located on the transfer drum and a cooperating element located on the axial movable means for engaging each of said engageable elements; and independent means for detecting the position of the means for axially moving the transfer drum; for detecting the rotational position of the transfer drum; and for detecting, respectively, whether the cutting means, the application means and the pressing means is in an operative or inoperative position.

3,852,143

TURRET ASSEMBLY

Wilhelm Brey, Cuyahoga Falls, Ohio; William Hostetler, Santa Ana, Calif.; Earl Ferdnand Loeffler, Akron, Ohio; Hubert Ernest Kolm, Louisville, Ohio, and Fred Grove Elder, Atwater, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 10,579, Feb. 11, 1970, Pat. No. 3,700,526.
This application Sept. 15, 1971, Ser. No. 180,920
Int. Cl. B29h *17/00*
U.S. Cl. 156—396 **2 Claims**



1. Mechanism for clasping a tire building drum by its drum shaft and rotating it in a vertical plane to a plurality of spaced stations, comprising

a. a drive shaft;

b. arcuately spaced radial turret arms fixed at each end of said drive shaft;

c. a pair of arcuate fingers at the radially outer end of each arm, pivoted to open and close selectively about a tire building drum shaft;

d. means to rotate said drive shaft; and

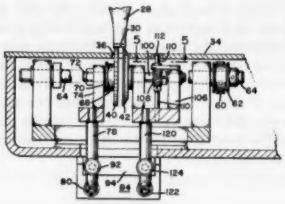
e. means to operate said fingers.

3,852,144

ULTRASONIC SEAMING AND CUTTING APPARATUS

Frank Parry, Monroe, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Filed Mar. 16, 1973, Ser. No. 341,860
Int. Cl. B06b *3/00*; B23k *1/06*
U.S. Cl. 156—510 **18 Claims**



1. An ultrasonic seaming and cutting apparatus comprising: a horn adapted to be resonant at a predetermined frequency of sound having a frontal surface for imparting ultrasonic energy to a workpiece fed in front and in contact with said surface;

electroacoustic converter means coupled to said horn for causing said horn to be resonant;

a rotatably mounted anvil wheel disposed opposite said frontal surface for engaging the underside of a workpiece and responsive to being rotated feeding the workpiece by

contact with the peripheral surface of said wheel past said frontal surface;

an instrumentality having a cutting edge mounted in juxtaposition with said anvil wheel and opposite said frontal surface in a manner to cause the cutting edge to be disposed for engaging the underside of the workpiece as the workpiece is fed past said frontal surface, and

means coupled to said anvil wheel and said instrumentality for independently urging the peripheral portion of said wheel disposed opposite said frontal surface and said cutting edge toward engagement with the frontal surface of said horn for effecting seaming and cutting of the workpiece.

3,852,145

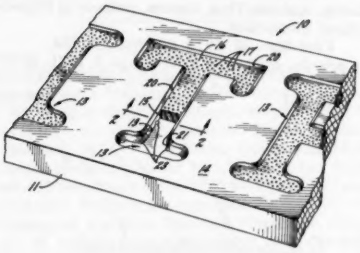
SIGN WITH INLAID LETTERS

Kenneth R. Kloweit, 1304 Leaman Pl., Rockford, Ill. 61108

Filed Nov. 16, 1973, Ser. No. 416,615

Int. Cl. B44f *7/00*

U.S. Cl. 161—18 **6 Claims**



1. A sign with intelligible figures having en engraved appearance comprising a wooden base with a planar outer surface, an outwardly opening groove formed within said base and defining one of said figures, a thermosetting plastic inlay partially filling said groove and having an exposed surface spaced inwardly of and extending generally parallel with the outer surface of said base, a plurality of reflective beads embedded within said inlay, a cavity formed adjacent the bottom of said groove and extending laterally thereof into said base, a portion of said inlay being received within said cavity to lock said inlay within said groove, and a chamfer formed in said base and around said groove so as to slant away from said groove upon progressing outwardly from the exposed surface of the inlay toward the outer surface of said base thereby increasing the field of readability of said figure.

3,852,146

CONTOURED ARTICLE WITH THREE DIMENSIONAL SURFACE THEREON

William H. Squier, Taylors, and William E. Poteat, Greer, both of S.C., assignors to M. Lowenstein and Sons, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 272,340, July 17, 1972,. This application Oct. 2, 1972, Ser. No. 294,353

Int. Cl. B44f *7/00*

U.S. Cl. 161—19 **14 Claims**

1. A molded article of manufacture, said article comprising a molded foam polymeric mass of a predetermined shape, said mass having a three dimensional design molded in situ into at least a portion thereof, said three dimensional surface having an adhesive layer thereon and textile fibers secured to said adhesive layer.

3,852,147

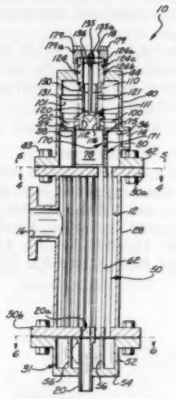
HEAT EXCHANGER

Warren M. Wilson, 809 Superior Dr., Huron, Ohio 44839

Filed Apr. 24, 1972, Ser. No. 246,622

Int. Cl. G05d *23/00*

U.S. Cl. 165—36 **25 Claims**



1. Apparatus for heating water by steam comprising a heat exchanger having a steam chamber, fluid conduit means for directing water through said steam chamber to a water outlet chamber, inlet steam conduit means for delivering steam to said steam chamber, a member located in said water outlet chamber and movable therein in response to a change in the demand for hot water, and bypass valve means controlled by movement of said member for continuously directing some cold water to said outlet chamber without flowing through said fluid conduit means so as to continuously mix with heated water during flow conditions.

3,852,148

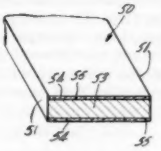
ARCHITECTURAL PRODUCTS FORMED OF GLASS OR CERAMIC-TO-METAL COMPOSITES

Michael J. Pryor, Woodbridge, and James M. Popplewell, Guilford, both of Conn., assignors to Olin Corporation, New Haven, Va.

Continuation-in-part of Ser. Nos. 78,899, Oct. 7, 1970, Pat. No. 3,676,292, and Ser. No. 231,834, March 6, 1972,. This application May 18, 1972, Ser. No. 254,666

Int. Cl. B32b *15/04, 15/20*

U.S. Cl. 161—41 **7 Claims**



1. A panel comprising:

a backing member having a side and an opposing side; and

a composite facing comprising;

a. a metal sheet having a major face and an opposing major face, and being prepared from a copper base alloy comprising from about 2 to about 12% aluminum, .001 to 3% silicon, up to 35% zinc and a grain refining element selected from the group consisting of iron up

to 4.5%, chromium up to 1%, zirconium up to 0.5%, cobalt up to 1% and mixtures thereof, balance essentially copper, and

b. a coating selected from the group consisting of glasses and ceramics which is involved in a bond selected from the group consisting of glass-to-metal bonds and ceramic-to-metal bonds, and is formed over at least one of said major face and said opposing major face of said sheet,

said composite facing being affixed to at least one side of said backing member whereby the uncoated major face, if any, of said sheet is in contact with the side or sides of said backing member.

3,852,149

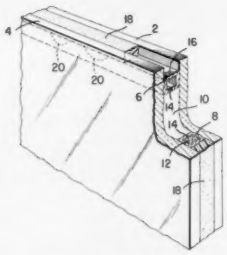
INSULATING GLASS WINDOW ASSEMBLIES

Matthew M. Sitter, Convent Station, N.J.; Robert M. Meyers, Fairless Hills, Pa., and Edward F. Kutch, Trenton, N.J., assignors to Novogard Corporation, Trenton, N.J.

Filed Apr. 19, 1972, Ser. No. 245,596

Int. Cl. E06b *3/24;* **C03c** *27/00*

U.S. Cl. 161—45 **14 Claims**



1. A window assembly comprising a plurality of panes of glass, spacing means located between said panes of glass adjacent the edges thereof and serving to hold said panes in predetermined spaced relation, said spacing means and glass panes cooperating to present an outwardly facing channel extending about the periphery of the assembly, and a hot melt sealant composition in continuous fluid contact with said glass and spacing means, said sealant being of the type which is fluid at temperatures above about 200°F but hardens upon cooling without undergoing chemical reaction and has a hardness at room temperature of about 10 to 80 on a Shore A Durometer, said sealant composition consisting essentially of from about 20 to 100 parts by weight of an elastomeric polymer having a molecular weight not less than about 15,000 and selected from the group consisting of copolymers of isobutylene and isoprene, polyisobutylene, styrene-butadiene polymers, styrene-isoprene polymers, chlorinated rubber and solid polysulfide polymers; from 15 to 150 parts by weight of plasticizing and tackifying resins; from 0 to about 44 parts by weight of adhesion promoters, and from about 0 to 150 parts by weight of fillers and pigments; said composition having a moisture transmission not exceeding 8 as determined by ASTM-E96-63T procedure B.

3,852,150

RESILIENT ENERGY ABSORBING ASSEMBLY

Peter A. Weller, Durham, N.H., assignor to McCord Corporation, Detroit, Mich.

Filed Jan. 15, 1973, Ser. No. 323,483

Int. Cl. B32b *3/12, 3/30;* **B60r** *19/08*

U.S. Cl. 161—96 **18 Claims**

1. An energy absorbing assembly comprising: yieldable material; and composite network means embedded within said material, said composite network means including a plurality of integral sheets of material each joined at at least three spaced points with adjacent sheets to define a plurality of compartments, said composite network means including at least two elongated means in substantially parallel spaced relationship and link means interconnecting said elongated means to define said compartments, said elongated means and

said link means being defined by said plurality of sheets of material each of which defines at least a portion of each of two adjacent elongated means and a link means extending therebetween each sheet extending along a first elongated means and through a first link means inclined forwardly to a second elongated means and then through a second link means inclined rearwardly to a third elongated means.

3,852,151

POLYESTER-METAL LAMINATES

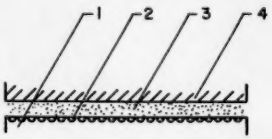
Erich Knapp, Kufstein/Tirol, Austria, assignor to Ciba-Geigy A-G, Basel, Switzerland

Filed Mar. 30, 1972, Ser. No. 239,724

Claims priority, application Austria, Apr. 2, 1971, 2832/71

Int. Cl. B32b *5/16*

U.S. Cl. 161—162 **2 Claims**



1. A laminate comprising one or more layers each of 0.3 to 100 mm thickness of a saturated thermoplastic polyester with a melting point not lower than 200°C, one or more continuous metal layers each bonded by an adhesive layer to said polyester layer, which laminates are characterized by the polyester layer having imbedded on at least one of its bonding surfaces with an additional discontinuous layer imparting greater adhesive power wherein said discontinuous layer is a material selected from the group consisting of manganese, iron, aluminum, copper, nickel, chromium, bismuth, tin, magnesium, brass, bronze, antimony-lead, corundum, gypsum, calcite, clay, and silicate, particles of 10 to 100 microns in size applied in amounts of 10 to 300 grams per square meter of the polyester bonding surface.

3,852,152

RESILIENT CUSHION

Helmut Werner, Elsenfeld, and Hans Stapp, Momlingen, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 807,301, March 14, 1969, Pat. No. 3,687,759. This application July 13, 1972, Ser. No. 271,355

Claims priority, application Germany, Mar. 21, 1968, 1778026The portion of the term of this patent subsequent to Sept. 12, 1989, has been disclaimed.

Int. Cl. B32b *5/02;* **D04h** *3/16*

U.S. Cl. 161—168 **6 Claims**

1. A resilient cushioning unit consisting essentially of a plurality of continuous melt-spun filaments of a substantially amorphous synthetic thermoplastic fiber-forming polymer with a filament diameter of between about 0.1 and 1 mm.,

each of said continuous filaments extending side by side in the direction of compression of the cushioning unit in the form of filamentary springs having substantially periodic helical to sinuous loops which coil around parallel vertical axes corresponding to said direction of compression, said loops of each

filamentary spring spreading laterally in overlapping relationship with the corresponding loops of the next adjacent filamentary springs with a random adhesive bonding of the filaments at their points of intersection to form a cohesive structure substantially more resilient in the vertical direction than in the direction transverse thereto.

3,852,153

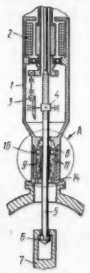
CONTROL ROD DRIVE IN A NUCLEAR REACTOR

Boris Arkadievich Maslenok, Kolpino, ulitsa V. Slutskoi, 34, kv. 40; Anatoly Sergeevich Khegai, Kolpino, ulitsa Vokzalnaya, 11, kv. 10; Viktor Grigorievich Zlobin, Kolpino, ulitsa V. Slutskoi, 38, kv. 223; Viktor Georgievich Mednitsky, Kolpino, prospekt Lenina, 9/15, kv. 15; Lev Isaakovich Genkin, 2 Sovetskaya ulitsa, 18/2, kv. 5; Nikolai Fedorovich Petrichenko, Pushkin, Leningradskaya ulitsa, 18, kv. 9, all of Leningrad, and Boris Ivanovich Mitrofanov, ulitsa Mira, 8, kv. 31, Podolsk Moskovskoi oblasti, all of U.S.S.R.

Filed Apr. 5, 1972, Ser. No. 241,236

Int. Cl. G21c *7/12*

U.S. Cl. 176—36 R **1 Claim**



1. A control rod drive in a nuclear reactor comprising in combination, a pressurized nuclear reactor; a casing affixed to said nuclear reactor; pressurized driving means in said casing; a drive rod linked to said driving means; a control rod connected to said drive rod; and means for preventing spontaneous movement of said control rod and comprising: a chamber at the bottom of said casing, a piston in said chamber, spring means for abutting said piston against a predetermined surface in the lower end of said chamber, said chamber, piston and spring means being coaxial with said drive rod, said piston having a tapered surface at the top of said piston and having radial slots, said chamber having a tapered top portion mateable with the tapered surface of said piston, ball-shaped members in said radial slots of said piston for rolling against the tapered portion of said chamber into contact with said drive rod when said driving means is depressurized and said piston is moved upwardly by the pressure in said nuclear reactor, said ball-shaped members holding said drive rod and said control rod in locked position for preventing spontaneous movement of said control rod, and a partition tube in said chamber, said partition tube being fixedly positioned to the lower end of said chamber and coaxial with said drive rod and said piston for preventing said ball-shaped members from contacting said drive rod and holding said drive rod in locked position when said drive means is under pressure and the piston is at the lower end of said chamber, said chamber having openings communicating with the active zone of the nuclear reactor and with the pressurized driving means, said partition tube having a length less than the axial length of said chamber.

3,852,154

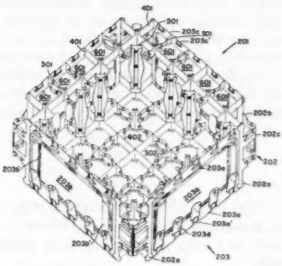
NUCLEAR REACTOR SPACER DEVICE

Roy C. Carlson, Richland; Loyd L. King, Benton City, and George A. Sofer, Richland, all of Wash., assignors to Jersey Nuclear Company, Bellevue, Wash.

Filed Feb. 4, 1972, Ser. No. 223,528

Int. Cl. G21c *3/34*

U.S. Cl. 176—78 **13 Claims**



1. A spacer device for maintaining the spatial integrity of fuel elements assembled in a nuclear reactor subassembly and having fuel element openings at least at the corners thereof which comprises:

a. a peripheral support band comprising corner means having an open webbed configuration consisting of vertical and horizontal interconnected members and including spaced dimples which are open at the top and bottom thereof and extend into said openings in spaced relation relative to said members and side means adjacent thereto, said corner means being attached to said side means, said side means including an outward raised middle section having openings in the lower portion thereof leading to a cavity formed by said raised middle section;

b. upper and lower support strips attached to said peripheral support band and intersected to form said fuel element openings within said peripheral support band; and

c. elongated spring assemblies captured internally at opposite ends thereof by said upper and lower support strips respectively where at least some of said support strips intersect, said support strips located externally at opposite ends of said spring assemblies.

3,852,155

CRYOPRESERVATION OF EQUINE CELL CULTURES

Richard W. Moore, Box 3568, Bryan, Tex. 77801

Filed Sept. 2, 1971, Ser. No. 177,453

Int. Cl. C12b *3/00, 9/00*

U.S. Cl. 195—1.8 **6 Claims**

1. A method for the cryopreservation of an equine cell culture selected from the group consisting of horse leukocyte cultures and equine primary kidney cultures which comprises:

suspending said equine cell culture in a cryopreservative medium comprising 8 to 10 percent by volume dimethyl sulfoxide and a nutrient medium containing sheep serum of fetal bovine serum in an amount sufficient to provide more than 80 percent by volume of said composition; and

subjecting the suspension to cryogenic temperatures to freeze said suspension.

3,852,156

PROCESS FOR THE PREPARATION OF 6-AZAURACIL RIBOTIDE

Kiyoshi Nakayama, Sagamihara, and Haruo Tanaka, Machida, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 737,375, June 17, 1968, abandoned, which is a continuation of Ser. No. 671,561, Sept. 29, 1967, abandoned. This application Apr. 18, 1973, Ser. No. 352,349

Claims priority, application Japan, Oct. 6, 1966, 41-65428

Int. Cl. C12d *13/06*

U.S. Cl. 195—28 N **14 Claims**

1. A process for the preparation of 6-azauracil ribotide by fermentation which comprises culturing a microorganism belonging to a genus selected from the group consisting of *Brevibacterium*, Corynebacterium, Arthrobacter and Micrococcus under aerobic conditions in an aqueous nutrient medium containing at least one phosphate ion source and as an additive substance a compound selected from the group consisting of 6-azauracil and 6-azauridine to produce and accumulate said 6-azauracil ribotide in said medium, and then recovering the 6-azauracil ribotide from the resultant culture liquor.

3,852,157

COMPOUNDS FOR ENZYME AMPLIFICATION ASSAY

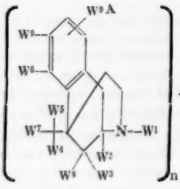
Kenneth E. Rubenstein, Palo Alto, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 143,609, May 14, 1971, abandoned. This application Nov. 6, 1972, Ser. No. 304,157

Int. Cl. G01n *31/14;* **C07g** *7/02*

U.S. Cl. 195—63 **11 Claims**

1. An enzyme-bound-ligand of the formula:



wherein:

any one of the W groups can be —X* or an H of any of the W groups may be replaced by —X* wherein —X* is a bond or a linking group;

A* is an enzyme bonded at other than its reactive site, having *n* ligands, wherein n is in the range of 1 to the molecular weight of —A* divided by 2,000;

W^1 is hydrogen, or hydrocarbon of from one to eight carbon atoms;

W^2, W^3 and $W^{0.4}$ are hydrogen;

W^4 is hydrogen or taken together with W^3 a divalent radical of from three to six carbon atoms and zero to two oxygen atoms, forming a 6-membered carbocyclic ring with the carbon chain to which they are attached;

W^5 is hydrogen or hydroxyl;

W^6 is hydrogen, hydroxyl, or taken together with W^5, oxy;

W^7 is hydrogen or methyl;

W^8 is hydrogen, methyl, or hydroxyl;

W^9 is hydrogen, hydroxy, acyloxy of from one to three carbon atoms, hydrocarbyloxy of from one to three carbon atoms, 2-(N-morpholino)ethoxy, or glucuronyl.

3,852,158

CULTURE MEDIA FOR STARTER PRODUCTION

Delmar L. Anderson, 208 Blueberry Ln., Syracuse, N.Y. 13219; Louis R. Boston, 1802 Chestnut Ridge Rd., Chittenango, N.Y. 13037, and William A. Seleen, 200 Dewitshire Rd., De Witt, N.Y. 13214

Filed June 5, 1972, Ser. No. 259,862

Int. Cl. C12k *1/10, 3/00*

U.S. Cl. 195—100 **5 Claims**

1. A culture media for producing bacterial starter cultures consisting essentially of on a dry basis:

a. from about 70 to 95 parts of a milk product consisting essentially of a major amount of undecalcified sweet whey, and a minor amount of undecalcified nonfat dry milk,

b. from about 0.5 to 10 parts of a nitrogen source selected from the group consisting of yeast extract, yeast autolysate, solubilized yeast and food yeast and,

c. from about one to about 30 parts, based upon citrate anion exclusive of cation weight, of an added citrate source selected from the group consisting of citric acid and salts of citric acid, such ingredients being combined in such a manner so as to provide about 100 total parts of ingredients.

3,852,159

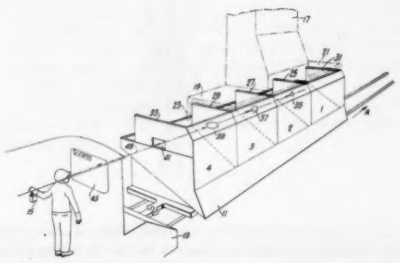
COKE QUENCHING CAR ALIGNMENT INDICATING SYSTEM

Ronald O. McClelland, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed July 24, 1973, Ser. No. 382,161

Int. Cl. C10b *39/14;* **B61b** *3/00*

U.S. Cl. 202—227 **6 Claims**



1. In a coke quenching car having end and side walls connected endwise to a locomotive having an operator therein, the improvement comprising:

a. at least one transverse baffle subdividing said car into two coke-receiving compartments said baffle having an aperture disposed along a line of sight observed by said operator; with

b. the end wall of said car adjacent said locomotive having therein an aperture that is larger than the aperture in said baffle and that is disposed along said line of sight.

3,852,160
DISTILLATION OF PENTACHLOROPHENOL WITH SALICYLALDEHYDE AND WATER

William David Watson, and Erwin H. Kobel, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 23, 1973, Ser. No. 363,224
Int. Cl. B01d 3/34; C07c 39/36
U.S. Cl. 203—6 3 Claims

1. A process for purifying impure pentachlorophenol which comprises distilling said pentachlorophenol at subatmospheric pressure in the presence of contacting water and about 0.05–2 percent of salicylaldehyde based on the weight of pentachlorophenol, thereby separating purified pentachlorophenol as a distillate from higher boiling impurities.

3,852,161
DISTILLATION OF PENTACHLOROPHENOL

Masao Yoshimine, and Erwin H. Kobel, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

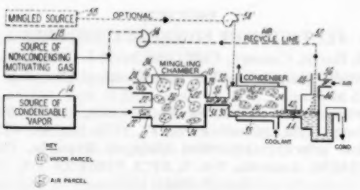
Filed July 5, 1973, Ser. No. 376,756
Int. Cl. B01d 3/34; C07c 39/36
U.S. Cl. 203—6 3 Claims

1. A process for purifying impure pentachlorophenol which comprises distilling said pentachlorophenol at subatmospheric pressure from its mixture with about 0.05–3 percent based on the weight of pentachlorophenol of the distillation residue remaining from the Reimer-Tiemann preparation of salicylaldehyde wherein said distillation residue is that obtained by heating a reaction mixture of phenol with at least about an equivalent amount of chloroform and aqueous sodium hydroxide in substantial molar excess over the chloroform at about 50°C. to the boiling point of said reaction mixture until the reaction is substantially complete, acidifying the resulting reaction mixture with a strong mineral acid, thereby forming an oil layer, and distilling said oil layer until substantially all of the product salicylaldehyde has been separated by distillation from the thereby formed distillation residue.

3,852,162
DYNAMIC PRESSURIZED CONDENSING METHOD

George S. Light, P.O. Box 496, Winsted, Conn. 06098

Filed May 4, 1973, Ser. No. 357,333
Int. Cl. B01d 3/00, 3/10, 3/34, 1/14
U.S. Cl. 203—10 3 Claims



1. A method of condensing water vapor in the presence of air and removing a heat transfer inhibiting film from the condenser heat transferring surfaces comprising the steps of:

a. providing an enclosed pressurizable condenser having cooling surfaces forming a vapor condensing zone whereon the heat transfer inhibiting film is formed;

b. introducing intermingled but nondiffused parcels of water vapor and air by adding and intermingling parcels of motivating air having relatively higher pressure and velocity force components with parcels of water vapor to provide added dynamics to the flow of the water vapor through the condenser;

c. immediately after intermingling feeding the intermingled relatively nondiffused vapor and air parcels against the cooling surfaces under said force components to condense some of said vapor and continuously sweep said heat transfer inhibiting film from said cool surfaces by said motivating air;

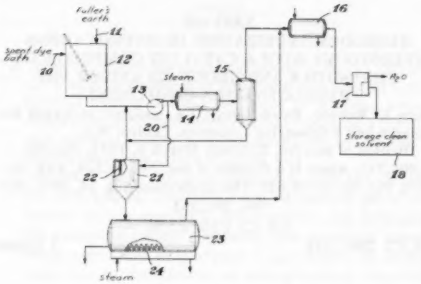
d. maintaining the dynamics of the motivating air to encourage turbulence and the sweeping action thereof as the vapor content decreases during condensation while discharging the air from the condenser; and

e. discharging the condensed water vapor from the condenser.

3,852,163
SPENT DYE LIQUOR CLEAN-UP AND VEHICLE RECOVERY

James L. Dunn, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 10, 1972, Ser. No. 233,433
Int. Cl. B01d 21/00
U.S. Cl. 203—47 3 Claims



1. A method for recovering solvent dye vehicle from a spent solvent dye bath by incorporating into the spent bath a solid absorbent in finely divided form, distilling a major portion of the volatile solvent therefrom; separating a major portion of the remaining solvent from the solid by filtration; distilling said filtrate and combining it with said first distillate; and, finally vaporizing the residual solvent from the filter cake, condensing the various solvent vapors produced and storing the condensate for reuse.

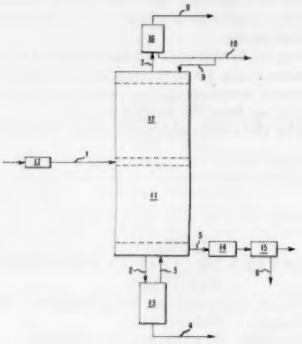
3,852,164
PURIFICATION OF 1,4-BUTANEDIOL BY VACUUM DISTILLATION WITH SIDE STREAM RECOVERY

Sidney Hsin Huai Chow, 4118 Bayon Grove Dr., and James Daniel Verbsky, 103 Whispering Oaks Dr., both of Seabrook, Tex. 77586

Filed Mar. 30, 1973, Ser. No. 346,675
Int. Cl. B01d 3/10; C07c 29/26
U.S. Cl. 203—91 6 Claims

1. A process of recovering 1,4-butanediol containing a minimum of water from a crude mixture containing, by weight, 1 to 20% water plus low boiling organic impurities, 80 to 99% 1,4-butanediol, and 0.05 to 5% combined high boiling organic tars and inorganic salts, which method comprises passing the crude mixture to a distillation column operating at subatmospheric pressure and adapted with a reboiler, withdrawing the overhead, passing the bottoms to the reboiler,

withdrawing liquid from the reboiler, passing vapor from the reboiler to the bottom of the distillation column, and with-



drawing vapor from the bottom portion of the distillation column as substantially pure 1,4-butanediol.

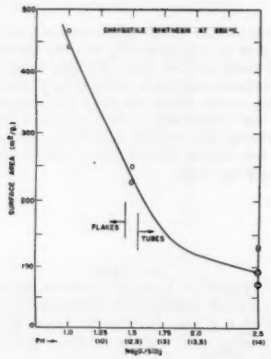
3,852,165
HYDRODESULFURIZATION OF HYDROCARBON FEEDSTOCKS WITH A CATALYST COMPOSITE OF CHRYSOTILE AND GROUP VIB AND/OR VIII HYDROGENATION COMPONENT

Harry E. Robson, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 233,368, March 9, 1972, Pat. No. 3,804,741, which is a division of Ser. No. 68,324, Aug. 31, 1970, Pat. No. 3,729,429. This application Aug. 24, 1973, Ser. No. 391,353

Int. Cl. C10g *23/02*

U.S. Cl. 208—216 **7 Claims**



1. A process for the hydrodesulfurization of sulfur-containing hydrocarbon feedstock boiling above about 340°C. which comprises contacting said feedstock with hydrogen and a catalyst composite comprising chrysotile and a hydrogenation component selected from the group consisting of Group VIB metal, Group VIII metal, oxides of said metals, sulfides of said metals and mixtures of said metals, said oxides and said sulfides.

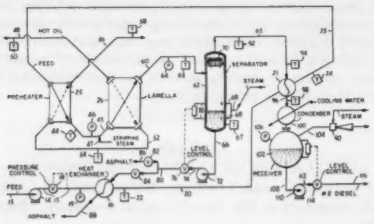
3,852,166
PROCESS FOR SEPARATING HYDROCARBON MATERIALS

Einar Henry Palmason, Santa Barbara, Calif., assignor to A. Johnson & Co., Inc., New York, N.Y.

Filed July 20, 1973, Ser. No. 381,059

Int. Cl. C10g *7/00*

U.S. Cl. 208—347 **22 Claims**



1. A continuous process for separating at least one hydrocarbon fraction of high definition out of a liquid hydrocarbon material, which comprises continuously introducing the liquid hydrocarbon material into a flow path of which a portion in cross-section transverse to the flow of the liquid hydrocarbon material therethrough is elongated in one direction and relatively narrow in a generally perpendicular direction; passing the liquid hydrocarbon material through the flow path while supplying heat at least along the portion of the flow path to cause the volatilization of part of the liquid hydrocarbon material in the portion of the flow path; continuing to pass a mixture of concentrated liquid hydrocarbon material and vapors released therefrom through the portion of the flow path while continuing to supply heat thereto, thereby to effect a high rate of vapor release and impart a high velocity to the mixture as it passes through the portion of the flow path; discharging the mixture from the flow path, without substantial additional release of vapors from the concentrated liquid hydrocarbon material and without a substantial change in pressure, and permitting the released vapors rapidly to separate and become isolated from the concentrated liquid hydrocarbon material, the concentrated liquid hydrocarbon material including said at least one hydrocarbon fraction and the released vapors including a second hydrocarbon fraction.

3,852,167
FLOTATION OF NICKEL SULFIDE ORES

Guy H. Harris, Concord, Calif., and David J. Collins, Darwin, Australia, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 224,609, Feb. 8, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,409

Claims priority, application Malagasy Republic, Feb. 8, 1973, 54830; Australia, Feb. 5, 1973, 51809/73

Int. Cl. B03d *1/02*

U.S. Cl. 209—166 **10 Claims**

1. In the process of concentrating sulfide minerals of nickel by froth flotation, the improvement which comprises contacting a sulfide nickel ore in the form of a pulp with a flotation collector comprising a compound corresponding to the formula

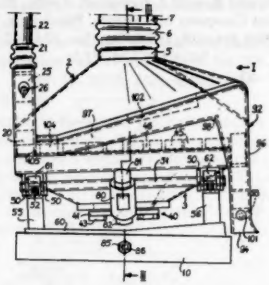
$$R - X - R_1 - \overset{H}{\underset{|}{N}} - \overset{S}{\overset{\|}{C}} - S - R_2$$

wherein R represents H or a hydrocarbyl group containing from one to 10 carbons, R_1 is an alkylene moiety containing from one to five carbons, R_2 is a hydrocarbon radical containing from one to seven carbons and X is O or S.

3,852,168
STRATIFIER WITH A PNEUMATIC PRODUCT RECIRCULATION

Hans Oetiker, Salisstrasse 4, 9000 St. Gallen, Switzerland

Continuation of Ser. No. 12,108, Feb. 17, 1970, abandoned.
This application Dec. 7, 1972, Ser. No. 312,950
Claims priority, application Switzerland, Feb. 21, 1969, 2706/69
Int. Cl. B07b 4/08, 11/06
U.S. Cl. 209—469 24 Claims



1. In a method for separating bulk material mixtures into separated fractions, in accordance with the specific gravities of the mixture components, under the influence of vibrations of a material support carrying the bulk material in a layer and conveying it from an inlet to outlets for separated fractions, and under the influence of aeration by an aeration air current flowing through the material support and the layer, which aeration air current is collected in a hodd covering the material support and is exhausted from the hood: the improvement comprising the steps of providing an additional air current flowing along a path separate from the path of flow of the aeration air current flowing through such layer, the path of flow of such additional air current being completely outside such layer of bulk material; discharging at least one separated fraction of the bulk material, leaving its outlet into such additional air current; thereafter separating the additional air current flow from such at least one separated fraction; returning such at least one separated fraction to such layer; and exhausting the aeration air current from said hood conjointly with exhaustion of the separated additional air current.

3,852,169
MEASUREMENT OF CARBON MONOXIDE IN GAS MIXTURES

Elbert Victor Kring, Hockessin, and William Ray Wolfe, Jr., Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

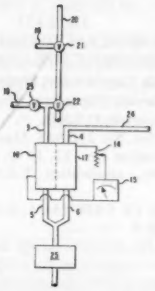
Filed Nov. 1, 1972, Ser. No. 302,859
Int. Cl. G01n 27/00, 27/46
U.S. Cl. 204—1 T 11 Claims

1. Method of measuring the concentration of carbon monoxide in internal combustion engine exhaust gas, said exhaust gas comprising carbon monoxide and other reductant gases, the volume ratio of the other reductant gases to CO being in the range 0.1:1 to 3.0:1, the method comprising the steps:

a. supplying simulated or actual internal combustion exhaust gas containing a known concentration of carbon monoxide, said simulated gas containing a concentration of carbon monoxide equivalent to that in the actual gas, at a constant flow rate and temperature, to a gas permeable, hydrophobic, electronically conductive, anodic electrode of an electrochemical cell which is operated at a temperature within the range 80—320°F., which electrode is capable of effecting electrochemical oxidation of carbon monoxide to carbon dioxide and is separated from a cathodic electrode in the cell by an ionically conductive electrolyte which is stable at the cell operating temperature,

b. at the same time supplying an oxygen-containing gas at a constant flow rate and temperature to the cathodic electrode which is a gas permeable, hydrophobic, electronically conductive electrode which is capable of effecting electrochemical reduction of oxygen to $O^=$,

c. measuring the resultant current or voltage generated in the electrochemically stoichiometric anodic and cathodic reactions in an external circuit between the two electrodes,



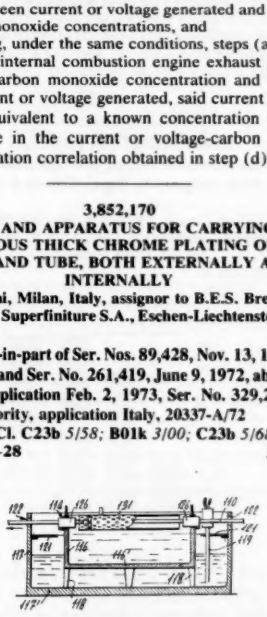
d. repeating under the same conditions, steps (a), (b) and (c) a sufficient number of times with simulated or actual internal combustion exhaust gases of differing known concentrations of carbon monoxide to establish a correlation between current or voltage generated and a range of carbon monoxide concentrations, and

e. repeating, under the same conditions, steps (a), (b) and (c) with internal combustion engine exhaust gas of unknown carbon monoxide concentration and measuring the current or voltage generated, said current or voltage being equivalent to a known concentration of carbon monoxide in the current or voltage-carbon monoxide concentration correlation obtained in step (d).

3,852,170
METHOD AND APPARATUS FOR CARRYING OUT CONTINUOUS THICK CHROME PLATING OF BAR, WIRE AND TUBE, BOTH EXTERNALLY AND INTERNALLY

Sergio Angelini, Milan, Italy, assignor to B.E.S. Brevetti Elettrogalvanici Superfiniture S.A., Eschen-Liechtenstein, Liechtenstein

Continuation-in-part of Ser. Nos. 89,428, Nov. 13, 1970, Pat. No. 375,344, and Ser. No. 261,419, June 9, 1972, abandoned.
This application Feb. 2, 1973, Ser. No. 329,220
Claims priority, application Italy, 20337-A/72
Int. Cl. C23b 5/58; B01k 3/00; C23b 5/68
U.S. Cl. 204—28 21 Claims



1. A method for continuously electroplating a plurality of elongated bars in a plating comprising:

a. mechanically attaching said bars together by couplings of the same section as said bars to provide a generally continuous electroplatable surface;

b. serially cleaning said attached bars prior to plating by passing said bars consecutively through a cleaning medium;
c. serially passing said bars into contact with an electrode whereby said bars are charged with an electroplating current;
d. serially heating said bars to the temperature of said bath prior to plating;
e. serially passing said bars through said electroplating bath and in the proximity of an electrode whereby said bars are electroplated; and
f. serially passing the plated bars out of said bath.

3,852,171
PROCESS FOR MANUFACTURING TANTALUM-OXIDE SEMICONDUCTOR CAPACITORS

Georgy Sergeevich Turchaninov, Studgorodok, 5, kv. 916, and Anatoly Vasilievich Voronkov, Studgorodok, 5, kv. 911, both of Krasnoyarsk, U.S.S.R.

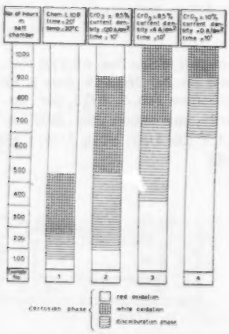
Continuation of Ser. No. 230,945, March 1, 1972, abandoned. This application Oct. 12, 1973, Ser. No. 406,097
Claims priority, application U.S.S.R., Mar. 29, 1969, 1313063
Int. Cl. C01b *13/14;* **C23b** *11/02*
U.S. Cl. 204—38 A **2 Claims**

1. A process for manufacturing tantalum-oxide semiconductor capacitors comprising; forming a tantalum oxide layer on a tantalum substrate by electrochemical oxidization means including an electrolytic bath containing an aqueous manganese salt solution with a current flowing through the electrolytic bath sufficient to provide a voltage across said bath 2 to 3 times greater than the rated voltage of the capacitor to be manufactured; forming a semiconductive manganese oxide layer on said tantalum oxide layer when said voltage has been achieved by depositing manganese oxide thereon in said electrolytic bath containing said aqueous manganese salt solution under potentiostatic conditions; applying a conducting coating onto said semiconductive manganese oxide layer.

3,852,172
ZINC OXIDATION PROCESS

Nicolo Gugliemi; Settimo Vittone, and Gianfranco Rolando, all of Turin, Italy, assignors to Ing. C. Olivetti & S.p.A., Torino, Italy

Filed June 8, 1972, Ser. No. 260,796
Claims priority, application Italy, June 9, 1971, 68985/71
Int. Cl. C23b *9/00, 5/00*
U.S. Cl. 204—56 R **10 Claims**

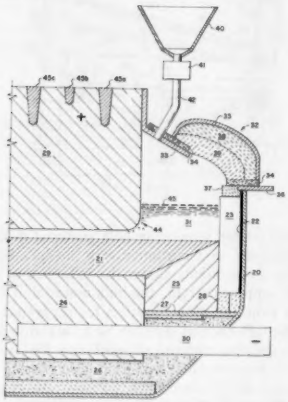


1. A method of forming an oxide layer on an object having a surface of zinc comprising the steps of:
a. immersing said object in an electrolytic bath including a solution of hexavalent oxide of the type XO_3, where X is an element selected from the group consisting of chromium molybdenum and tungsten, in a mixture of melted alkali metal salts, said bath having a melting point lower than the melting point of zinc;
b. passing a direct current of constant density through said bath using said object as an anode.

3,852,173
ALUMINA REDUCTION PROCESS

Stanley C. Jacobs; Noel Jarrett, both of Lower Burrell, Pa.; Robert W. Graham, Port Lavaca, Tex.; Perry A. Foster, Jr., New Kensington, Pa.; William C. Sleppy, Belleville, Ill.; C. Norman Cochran, Oakmont, Pa.; Warren E. Haupin, Lower Burrell, Pa., and Ronald J. Campbell, Apollo, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed June 28, 1973, Ser. No. 374,802
Int. Cl. C22d *3/12*
U.S. Cl. 204—67 **15 Claims**



1. A process for producing aluminum, comprising electrolytically decomposing alumina to aluminum metal in an electrolyte bath between a carbon anode and a cathodic interface formed between aluminum metal and the electrolyte bath, the bath
a. consisting essentially of Al_2O_3, NaF, and AlF_3, and
b. having a weight ratio NaF to AlF_3 up to 1.1:1,
while maintaining said bath at an operating temperature effective for preventing bath crusting in interfacial areas between bath and aluminum metal, while enclosing the top of the cell for keeping the surface of the bath molten, and while feeding alumina
a. substantially continuously onto the molten bath surface,
b. the alumina having a water content effective for preventing anode dusting,
c. the carbon anode being exposed to the gaseous water evolved from the alumina, whereby anode dusting is prevented.

3,852,174
HYDROPHOBIC COATINGS AND SYNTHESIS BY ELECTROCHEMICAL REDUCTION OF SULFONIUM COMPOUNDS

William J. Settineri, and Ritchie A. Wessling, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 879,511, Nov. 24, 1969, abandoned, which is a continuation-in-part of Ser. Nos. 647,895, June 22, 1967, Pat. No. 3,480,525, and Ser. No. 647,896, June 22, 1967, Pat. No. 3,480,527. This application Sept. 26, 1972, Ser. No. 292,292
Int. Cl. C07b *19/06;* **B01k** *1/00;* **C23l** *7/00*
U.S. Cl. 204—73 R **26 Claims**

1. A process for applying a nonpolymeric hydrophobic coating to a solid electroconductive article having a resistivity of less than about 10^8 ohm-cm. at 300° K. and being used as

a cathode in a system comprising an anode, a cathode, an aqueous electrolysis solvent which is predominantly water and a means for applying and maintaining an electrical potential between said anode and cathode, said process comprising subjecting a solution of an organic monosulfonium salt in said aqueous electrolysis solvent to an electrical potential sufficient to reduce said salt; said hydrophobic coating being substantially insoluble in said electrolysis solvent.

3,852,175

ELECTRODES HAVING SILICON BASE MEMBERS

Howard H. Hoekje, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 260,790, June 8, 1972,. This application Feb. 27, 1973, Ser. No. 336,288

Int. Cl. B01k *3/06*; **C01d** *1/06*

U.S. Cl. 204—98 **89 Claims**

1. An electrode having an electroconductive surface on a metallic base comprising at least 50 weight percent silicon, which base contains a dopant chosen from the group consisting of phosphorous, arsenic, antimony, bismuth, boron, aluminum. and gallium in an amount sufficient to provide said base with an electroconductivity greater than 100 (ohm-centimeters)$^{-1}$.

3,852,176

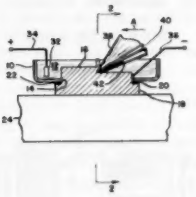
EMBRITTLEMENT MACHINING METHOD

Paul Rosenthal, Amherst, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Continuation of Ser. No. 117,995, Feb. 23, 1971, abandoned. This application Dec. 6, 1972, Ser. No. 336,115

Int. Cl. B23p *1/00*

U.S. Cl. 204—129.46 **2 Claims**



1. Embrittlement machining method comprising the steps of:

1. placing in a container an electrolytic solution the main constituent of which is alcohol,
2. immersing a workpiece having a portion to be machined in said solution adjacent a cutting head,
3. supplying an embrittling agent of mercury or mercury amalgam to said portion of the workpiece,
4. placing a first electrode in said solution forming an anode, and
5. applying a voltage potential across said anode and said workpiece.

3,852,177

METHOD OF RADIATION CROSS-LINKING OLEFIN POLYMERS CONTAINING ACRYLATE CROSS-LINKING PROMOTERS

George J. Atchison, and Donald J. Sundquist, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 2, 1972, Ser. No. 293,787

Int. Cl. B01j *1/10*, *1/12*

U.S. Cl. 204—159.17 **3 Claims**

1. A method of producing cross-linked polyethylene comprising applying high energy ionizing radiation to a mixture of polyethylene, a foaming agent, and a cross-link promoter selected from the group consisting of trimethylolpropane triacrylate, trimethylolpropane trimethacrylate, pentaerythritol tetraacrylate, and pentaerythritol tetramethacrylate in an amount such that the mixture absorbs a radiation dose of between about 0.1 and about 1 megarad, said cross-link promoter being present in said mixture in an amount up to about 10 weight percent based upon the weight of said mixture.

3,852,178

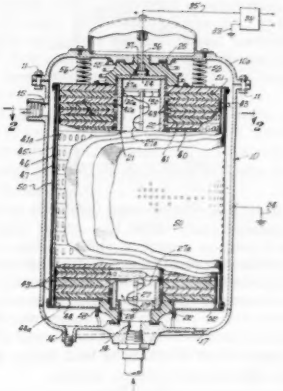
ELECTROSTATIC FILTERING FOR CLEANING DIELECTRIC FLUIDS

Edward A. Griswold, 2072 E. Galbreth Rd., Pasadena, Calif. 91104

Division of Ser. No. 538,275, March 29, 1966, Pat. No. 3,544,441, which is a continuation-in-part of Ser. No. 190,457, April 26, 1962, Pat. No. 3,252,885. This application Aug. 27, 1970, Ser. No. 67,585

Int. Cl. B03c *5/00*

U.S. Cl. 204—186 **23 Claims**



1. The method of separating particles suspended in a dielectric fluid stream that includes the steps of:

maintaining a substantially uniform, high voltage unidirectional electric field,

flowing the fluid stream through the electric field in a direction generally transversely to the field;

directly impacting the particles onto a surface by flowing the fluid stream at a sufficiently high velocity under turbulent flow conditions to effect contact charging of the particles at the surface followed by separation of the charged particles from said surface; and

collecting the charged and separated particles on stationary structure in a unidirectional electric field.

3,852,179

BIPOLAR DIAPHRAGM ELECTROLYTIC CELL HAVING INTERNAL ANOLYTE LEVEL EQUALIZING MEANS

Carl W. Raetzsch, Jr., and Hugh Cunningham, both of Corpus Christi, Tex., assignors to PPG Industries, Inc.,, Pittsburgh, Pa.

Filed July 20, 1973, Ser. No. 381,122

Int. Cl. B01k *3/10*

U.S. Cl. 204—256 **3 Claims**

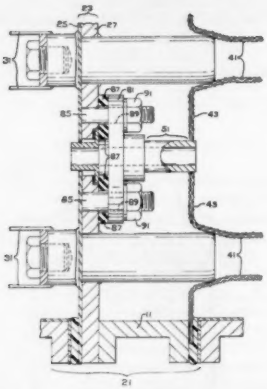
1. In a bipolar electrolyzer comprising a pair of diaphragm cells electrically and mechanically in series and separated by

a backplate having a catholyte-resistant surface facing the first of the pair of cells, and an anolyte-resistant surface facing the second of the pair of cells, an electrolyte permeable cathode in said first cell, spaced from and mechanically and electrically connected to the cathodic surface of said backplate and defining a catholyte volume therebetween, brine feed means to each of said cells, and gas recovery and product recovery means from each of said cells, the improvement comprising:

an aperture in said backplate;

bolt means extending from the catholyte-resistant surface of said backplate;

collared, anolyte-resistant conduit means extending through the anolyte-resistant surface of said backplate, the flange thereof bearing upon the catholyte-resistant surface of said backplate;



collared, catholyte-resistant conduit means corresponding to said anolyte-resistant conduit means, and extending from said anolyte-resistant conduit means to said cathode, whereby to provide equalizer means through said catholyte volume between anolyte volumes of said pair of cells independent of said brine feed means, gas recovery means, and product recovery means;

said bolt means passing through the collar of said catholyte-resistant conduit means, and nut means on said bolt means compressively bearing on said collar and said anolyte-resistant flange means whereby to provide an electrolyte tight seal between said anolyte-resistant conduit means and said catholyte-resistant conduit means;

and an electrolyte tight seal between said anolyte-resistant conduit means and the anolyte-resistant surface of said backplate.

3,852,180

APPARATUS FOR CO CONVERSION TO METHANE

Derek P. Gregory, Hinsdale, Ill., assignor to SKF Industrial Trading and Development Company, Amsterdam, Netherlands

Division of Ser. No. 223,546, Feb. 4, 1972, Pat. No. 3,766,027. This application Mar. 19, 1973, Ser. No. 342,506

Int. Cl. B01k *3/00*

U.S. Cl. 204—277 **7 Claims**

1. An apparatus for simultaneous electrolysis of water and methanation of CO_2 comprising in combination:

a. a housing,

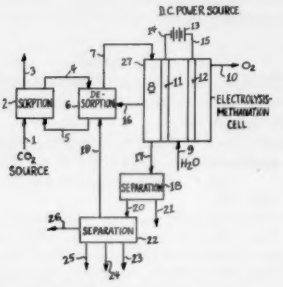
b. an external DC power source,

c. a cathode and an anode disposed in said housing connected to the external DC power source, said cathode being adapted to electrochemically evolve hydrogen therefrom,

d. said anode and cathode adapted to have an electrolyte disposed between them and

e. means for supplying water to said electrolyte,

f. means for separating CO_2 from a gas stream containing CO_2 to produce a CO_2 containing gas stream relatively



free of oxygen,

g. means for supplying said CO_2 stream to said cathode, to exothermically produce methane, and

h. means for exhausting a methane-containing product gas from said cathode.

3,852,181

CONTINUOUS CATHODE SPUTTERING SYSTEM

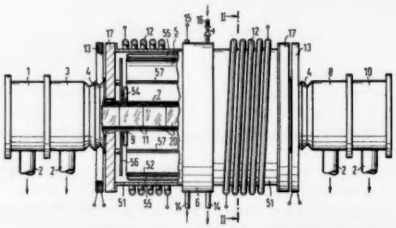
Werner Cirkler, Munich; Alois Schauer, Gruenwald, and Helmold Kausche, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin-Munich, Germany

Filed Oct. 30, 1973, Ser. No. 411,088

Claims priority, application Germany, Nov. 2, 1972, 2253769

Int. Cl. C23c *15/00*

U.S. Cl. 204—298 **15 Claims**

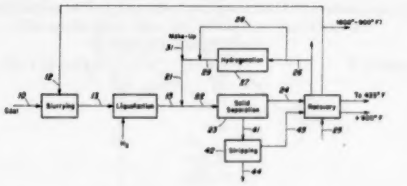


1. Coating apparatus comprising an input chamber, a heating chamber, a sputtering chamber, a cooling chamber, and an output chamber, means for connecting said chambers in series to permit a substrate member to be transported sequentially therethrough, said sputtering chamber comprising two cylindrical tubes formed of insulating material interconnected in axially aligned relationship by a metal connector, means for supporting a plurality of electrodes on said ring in position to envelop said chamber internally thereof, means on said ring for establishing a connection between at least one of said electrodes and a source of d.c. voltage, means for evacuating said sputtering chamber, means for introducing a gas into said sputtering chamber, a high frequency coil surrounding said sputtering chamber, and a transport means mounted centrally within said sputtering chamber and adapted to transport a plurality of groups of said substrates sequentially through the center of said sputtering chamber.

3,852,182
COAL LIQUEFACTION

Morgan C. Sze, Upper Montclair, and George J. Snell, Fords, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Nov. 7, 1972, Ser. No. 304,320
Int. Cl. G10g *1/04*
U.S. Cl. 208—8 **14 Claims**



1. A process for separating insoluble material from a coal liquefaction product produced from a coal feed and comprised of insoluble material and a coal solution of carbonaceous matter dissolved in a coal liquefaction solvent, comprising:

a. introducing said coal liquefaction product and a liquid promoter into a gravity settling zone, said liquid promoter having a 5 volume percent distillation temperature of at least about 250°F., and a 95 volume percent distillation temperature of at least about 350°F. and no greater than about 750°F., said liquid promoter having a characterization factor (K) of at least 9.75, said liquid promoter having a characterization factor greater than said coal liquefaction solvent and being added in an amount sufficient to produce a coal extract essentially free of insoluble material;

b. recovering by gravity settling as overflow a coal extract essentially free of insoluble material;

c. separating from said coal extract a fraction having a 5 volume distillation temperature of at least about 250°F. and a 95 volume distillation temperature of at least about 350°F. and no greater than about 750°F.;

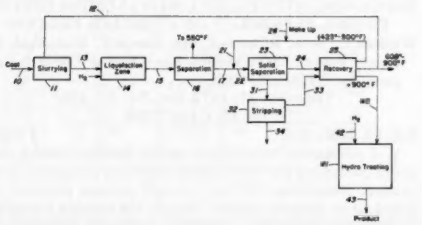
d. hydrogenating at least a portion of said fraction to produce a liquid promoter having a characterization factor greater than the characterization factor of said coal liquefaction solvent, said characterization factor being at least 9.75; and

e. employing liquid promoter from step (d) in step (a).

3,852,183
COAL LIQUEFACTION

George J. Snell, Fords, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Dec. 29, 1972, Ser. No. 319,637
Int. Cl. C10g *1/04*
U.S. Cl. 208—10 **8 Claims**



1. A process for liquefying coal to produce a coal liquefaction product from which insoluble material is more facilely separated, comprising:

hydrogenating coal in contact with a coal liquefaction solvent to effect liquefaction thereof, said hydrogenation being effected at a temperature of from about 700°F to about 900°F, a space velocity from about 1.0 to about 4.0 $hr.^{-1}$ and a hydrogen partial pressure from about 800 to about 3,000 psia to produce a coal liquefaction product comprised of carbonaceous matter dissolved in the coal liquefaction solvent and insoluble material dispersed in the liquefaction solvent having a weight ratio of ash free Benzene insolubles in the product to moisture ash free carbonaceous matter dissolved and dispersed in the coal liquefaction solvent from about 0.10 to about 0.18.

3,852,184
ISOMERIZATION OF REFORMER FEED USING A METAL HALIDE/HYDROGEN HALIDE CATALYST

Michael Siskin, Maplewood, and Joseph J. Porcelli, Scotch Plains, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 210,607, Dec. 21, 1971, abandoned. This application Dec. 22, 1972, Ser. No. 317,609
Int. Cl. C10g *35/04*; **B01j** *11/78*; **C07c** *13/18*
U.S. Cl. 208—64 **16 Claims**

1. A process for treating a reformer feedstock containing alkylcyclopentane and a component selected from the group consisting of sulfur compounds, aromatics, and mixtures thereof which comprises contacting said feedstock in the presence of hydrogen at a temperature between about −30° and 125°C. under substantially liquid phase isomerization conditions with a catalyst comprised of:

a. a metal halide wherein said metal is aluminum, gallium, tin, lead, vanadium, niobium, tantalum, arsenic, chromium, molybdenum, tungsten, rare earth and/or transuranium metal and said halide is fluoride, chloride, bromide and/or iodide, and

b. at least an equimolar amount, based on metal halide, of a hydrogen halide, said halide being fluoride, chloride, bromide and/or iodide, at least a portion of said metal halide being dissolved in said hydrogen halide; said contacting producing a treated feedstock having a reduced alkylcyclopentane content and an increased cyclohexane or alkylcyclohexane content.

3,852,185
HYDRODESULFURIZATION AND FCC OF BLENDED STREAM CONTAINING COKER GAS OIL

Robert D. Christman; Joel D. McKinney; Thomas C. Readal, and Stephen J. Yanik, all of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 29, 1973, Ser. No. 346,176
Int. Cl. C10g *23/04*
U.S. Cl. 208—89 **6 Claims**

1. A process for improving the ratio of gasoline to total conversion in a zeolitic riser cracking operation comprising passing a non-asphaltic sulfur-containing petroleum hydrocarbon feed oil comprising a sulfur-containing petroleum coker gas oil in minor proportion and a sulfur-containing virgin petroleum gas oil in major proportion and having a volume average boiling point of at least 700°F. together with hydrogen downflow over a fixed bed of hydrodesulfurization catalyst comprising Group VI and Group VIII metals on a non-cracking alumina support to remove at least 80 weight percent of the sulfur from the feed oil, regulating the amount of hydrodesulfurization catalyst in the bed to avoid excessively decreasing the boiling characteristics of the feed oil whereby an increase in the temperature differential between the 10 and 90 percent boiling points of the feed stream occurs but does not exceed 20°F. while the 90 percent boiling point of the feed is decreased at least 10°F., passing effluent from the hydrodesulfurization zone boiling above the gasoline range to a zeolite riser cracking process which avoids formation of a catalyst bed in the reaction flow path, and recovering a cracked gasoline product.

3,852,186

COMBINATION HYDRODESULFURIZATION AND FCC PROCESS

Robert D. Christman, Penn Hills Township; Joel D. McKinney, Indiana Township, and Thomas C. Readal, McCandless Township, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 29, 1973, Ser. No. 346,121
Int. Cl. C10g *23/04*
U.S. Cl. 208—89 **9 Claims**

1. A process for improving the ratio of gasoline to total conversion in a zeolitic riser cracking operation comprising passing a non-asphaltic sulfur-containing petroleum hydrocarbon feed oil having a volume average boiling point of at least 700°F. together with hydrogen downflow over a fixed bed of hydrodesulfurization catalyst comprising Group VI and Group VIII metals on a non-cracking alumina support to remove at least 80 weight percent of the sulfur from the feed oil, regulating the amount of hydrodesulfurization catalyst in the bed to avoid excessively decreasing the boiling characteristics of the feed oil whereby an increase in the temperature differential between the 10 and 90 percent boiling points of the feed stream occurs but does not exceed 20°F. while the 90 percent boiling point of the feed is decreased at least 10°F., passing effluent from the hydrodesulfurization zone boiling above the gasoline range to a zeolite riser cracking process which avoids formation of a catalyst bed in the reaction flow path, and recovering a cracked hydrocarbon product having an increased ratio of gasoline to total conversion as compared to the ratio obtainable with said feed oil under the same cracking conditions in the absence of said hydrodesulfurization.

3,852,187

HYDRODESULFURIZATION PROCESS FOR PRODUCING FUEL OIL AND FCC FEED

Robert D. Christman; Joel D. McKinney; Thomas C. Readal, and Stephen J. Yanik, all of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 29, 1973, Ser. No. 346,183
Int. Cl. C10g *23/04*
U.S. Cl. 208—89 **6 Claims**

1. A process comprising blending a sulfur-containing zeolite riser cracking petroleum heavy gas oil feed and a sulfur-containing petroleum furnace oil feed to form a non-asphaltic sulfur-containing total hydrodesulfurization feed oil having a volume average boiling point of at least 700°F., passing said total feed oil together with hydrogen downflow over a fixed bed of hydrodesulfurization catalyst comprising Group VI and Group VIII metals on a non-cracking alumina support to remove at least 80 weight percent of the sulfur from the total feed oil, regulating the amount of catalyst in the bed to avoid excessively decreasing the boiling characteristics of the total feed whereby an increase in the temperature differential between the 10 and 90 percent boiling points of the total feed stream occurs but does not exceed 20°F. while the 90 percent boiling point of the total feed is decreased at least 10°F., removing an effluent stream from said hydrodesulfurization process and passing at least the desulfurized heavy gas oil of the effluent stream to a zeolite riser cracking unit.

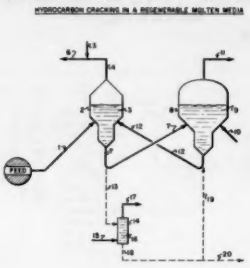
3,852,188

HYDROCARBON CRACKING IN A REGENERABLE MOLTEN MEDIA

John J. Dugan, and James P. Higgins, both of Sarnia, Ontario, Canada, assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 186,776, Oct. 5, 1971, abandoned. This application Aug. 14, 1972, Ser. No. 280,182
Int. Cl. C10g *11/02*
U.S. Cl. 208—114 **17 Claims**

1. A process for cracking a hydrocarbon feedstock which comprises contacting said feedstock with a regenerable molten media comprising an oxide of phosphorus in combination with an alkali metal compound selected from the group consisting of alkali metal oxides, alkali metal hydroxides, alkaline earth metal oxides, alkaline earth metal hydroxides and mixtures thereof, wherein the mole ratio of the alkali metal compound expressed as the oxide thereof to the oxide of phosphorus is in the range of from about 1.2 to about 2.5, at a temperature in the range of from above the melting point of said media to about 3,000°F. for a time sufficient to form cracked hydrocarbon products and to uniformly suspend the carbonaceous materials formed during said cracking operation throughout the molten media.



3,852,189

SHAPE-SELECTIVE CONVERSION IN THE LIQUID PHASE

Nai Y. Chen, Titusville, and William E. Garwood, Haddonfield, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 94,569, Dec. 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 865,470, Oct. 10, 1969, Pat. No. 3,700,585. This application May 30, 1972, Ser. No. 257,729
Int. Cl. C10g *11/18*; **C01b** *33/28*
U.S. Cl. 208—120 **4 Claims**

1. A process for dewaxing petroleum charge stocks boiling above 350°F which comprises contacting said charge in the absence of added hydrogen and at a temperature of 400°–900°F and a pressure sufficient to maintain said charge in the liquid phase, said pressure ranging from about 100–3,000 psig with a crystalline aluminosilicate zeolite having an X-ray diffraction pattern set forth in Table 1 so as to selectively crack straight-chain hydrocarbons and branched-chain hydrocarbons free from quaternary carbon atoms in their structure, said aluminosilicate having a composition, in terms of oxide mol ratios as follows:

$$0.9 \pm 0.2\ M_{2/n}O : Al_2O_3 : 5 - 100\ SiO_2 : z\ H_2O$$

wherein M is a cation, n is the valence of said cation and z is from 0 to 40.

3,852,190

REFORMING WITH PLATINUM ON ALUMINA DERIVED FROM A BYPRODUCT OF A ZIEGLER PROCESS

Waldeen C. Buss, Richmond, and Harris E. Kluksdahl, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 27, 1972, Ser. No. 301,696
Int. Cl. C10g *35/08*
U.S. Cl. 208—138 **3 Claims**

1. A process for reforming a naptha feedstock which comprises contacting the feedstock at reforming conditions with a catalyst comprising 0.01 to 5 weight percent platinum disposed on an alumina support wherein the alumina is obtained by removing water from aluminum hydroxide produced as a byproduct from a Ziegler higher alcohol synthesis reaction and wherein the alumina is calcined at 1,150° to 1,350°F. so as to have a surface area of 165–215 square meters per gram.

3,852,191

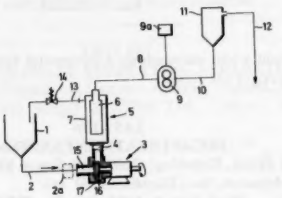
PROCESS AND APPARATUS FOR THE PRODUCTION OF A DISPERSION OR SOLUTION FROM COMMINUTED SOLID SUBSTANCES AND A DISPERSION MEDIUM OR SOLVENT

Friedrich Josef Zucker, Mulheim (Ruhr), and Hans-Dieter Bruchmann, Cologne-Deutz, both of Germany, assignors to Deutsche Supraton Bruchmann & Zucker KG, Dusseldorf, Germany

Continuation of Ser. No. 136,761, April 23, 1971, abandoned. This application Dec. 29, 1972, Ser. No. 334,788

Int. Cl. B01d *29/42*

U.S. Cl. 210—71 **9 Claims**



1. A process for the continuous production of a filtrate from a mixture of solid materials and a fluid medium consisting essentially of the steps of:

a. supplying solid materials having varying particle sizes and a fluid medium to form a mixture thereof,

b. subjecting the mixture to a comminuting treatment in a comminuting treatment zone,

c. introducing the mixture of the solid material and the fluid medium into a filtering zone directly from the comminuting treatment zone,

d. passing an acceptable portion of the mixture of solid material and fluid medium through a filter which allows a predetermined particle size of solid material to pass therethrough thereby leaving a rejected residue, and then

e. recycling said rejected residue which contains particle sizes exceeding said predetermined particle size directly to the comminuting treatment zone.

3,852,192

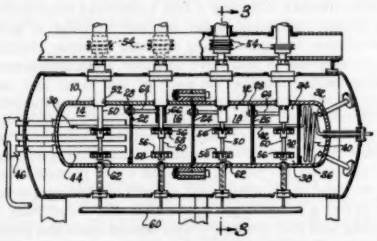
REACTOR FOR WET OXIDATION OF ORGANIC MATTER

W. Martin Fassell, Newport Beach, and Donald W. Bridges, Irvine, both of Calif., assignors to Barber-Colman Company, Rockford, Ill.

Continuation-in-part of Ser. No. 346,152, March 29, 1973,. This application Oct. 4, 1973, Ser. No. 403,652

Int. Cl. C02b *1/34*

U.S. Cl. 210—63 **25 Claims**



1. A reactor for wet oxidation of combustible organic matter in solution or dispersion in aqueous medium at elevated temperature and pressure comprising an elongate horizontally disposed housing having an inlet at one end portion for the introduction of the aqueous medium for wet oxidation and an outlet at the opposite end portion for the removal of aqueous medium which has been subjected to wet oxidation during travel through the housing, vertical walls longitudinally spaced in the housing to subdivide the housing into a number of completely separated compartments, passages communicating one compartment with another for flow of fluid therethrough from one compartment to the other and whereby the compartments are divided into a vapor zone above the level of the communicating passage and a liquid zone below the level of the communicating passage, a source of oxygen containing gas, means for introducing the oxygen containing gas into the compartment, and agitation means in compartments for maintaining the aqueous medium under a high state of agitation whereby oxygen containing gas which accumulates in the vapor space is re-entrained with aqueous medium, said means for introducing the oxygen containing gas being disposed for introduction of same in the immediate vicinity of the zone of agitation whereby the oxygen containing gas is reduced into fine droplets for intimate association with the organic matter dissolved or dispersed in aqueous medium to provide reactive oxidation sites.

3,852,193

LIQUID-PURIFYING PROCESS AND APPARATUS

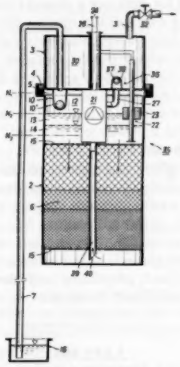
Peter Jakubek, Gebirge, and Karl Biswanger, Wien, both of Austria, assignors to Firma Research Filter- und Patentforschungs-Ges.m.b.H., Wien, Austria

Filed Mar. 16, 1973, Ser. No. 342,252

Claims priority, application Austria, Mar. 20, 1972, 52349/72

Int. Cl. B01d *21/24, 23/26*

U.S. Cl. 210—73 **34 Claims**



1. A process of purifying a polluted liquid which contains a liquid impurity having a lower specific gravity than the polluted liquid, which process comprises

intermittently sucking said polluted liquid from an antechamber into a filter through a separating chamber,

intermittently sucking filtered liquid from said filter and discharging said filtered liquid under pressure through an equalizing chamber,

controlling the intermittent sucking and discharge of said liquid in dependence on the liquid level in said antechamber; and subjecting said liquid in said separating chamber to to a preseparation to remove a major portion of said liquid impurity.

3,852,194
APPARATUS AND METHOD FOR FLUID COLLECTION AND PARTITIONING

Anthony R. Zine, Jr., Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 11, 1972, Ser. No. 314,270
Int. Cl. B01d 21/26
U.S. Cl. 210—83 3 Claims

1. A fluid collection and partitioning assembly for collecting a specimen of blood within a sealed fluid collection chamber, centrifically separating the heavier and lighter fluid phases of said blood specimen, and physically and chemically partitioning the separated phases, comprising:

a. a container having an open end and a closed end;

b. gel-like means initially positioned within said container adjacent said closed end for forming a transversely continuous contact seal with an annular surface portion within said container at a subsequently formed interface between said heavier and lighter phases;

c. closure means for vacuum-sealing said open end of said container and for defining a closed fluid collection chamber containing said gel-like means therewithin, said closure means being pierceable by a needle for supplying blood to said closed fluid collection chamber which is adapted to draw the blood specimen therewithin;

d. said gel-like means being a thixotropic material and including a mixture of a fluid which is generally inert to body fluids and a powdered inorganic filler; and

e. said gel-like means having a specific gravity intermediate those of said lighter and heavier phases and being of such a thixotropic composition such that during the centrifugation of said blood specimen into its component phases, said gel-like material is flowable from its initial position adjacent said closed end toward said sealed open end and effects a semi-rigid seal at the interface of said separated fluid phases which physically and chemically partitions said phases within said container.

3,852,195
LAYERING CONE

Grant G. Slater, 986 Somera Rd., Los Angeles, Calif. 90024

Filed July 17, 1972, Ser. No. 272,481
Int. Cl. B01d 17/00
U.S. Cl. 210—94 6 Claims

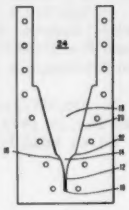
1. A layering cone device adapted to rapidly layer heavier liquids below lighter ones with a horizontal interface between layers which comprises:

a. a constricted inlet passage adapted to produce turbulent flow which communicates at an angle with,

b. a constricted riser adapted to contain turbulent flow,

c. communicating with and above said riser an expansion area characterized by interior surfaces which are of a concave curvature to quickly dissapate the turbulent flow and initiate non-turbulent flow while preventing faster or slower flow along said interior surfaces, and

d. above said expansion area an enlarged zone characterized by interior planar surfaces to further spread out the

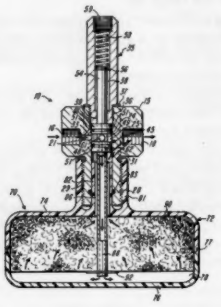


liquid while maintaining a horizontal interface between layers of the liquid.

3,852,196
FLUID TREATMENT SYSTEM

Roman Szpur, Kettering, Ohio, assignor to Vital Research & Development, Inc., Dayton, Ohio

Filed Sept. 8, 1972, Ser. No. 287,480
Int. Cl. B01d 35/02, 27/10
U.S. Cl. 210—133 3 Claims



1. A fluid treatment system comprising a valve body including means defining an inlet passage and an outlet passage adapted to receive a fluid, said valve body having an elongated internal cylindrical valve chamber intersecting said inlet and outlet passages, said valve chamber having a first inner end portion and a second outer end portion, a cylindrical valve member slidably supported within said valve chamber for axial movement between a first position adjacent said inner end portion and a second position adjacent said outer end portion, said valve member including a first cylindrical inner portion and a second cylindrical outer portion disposed in axially spaced relation and each having an outer diameter conforming to the diameter of said valve chamber, a circumferentially extending sealing member on each of said inner and outer portions of said valve member and forming a sliding fluid-tight seal with said body, means defining a radially extending fluid passage within said valve member between said inner and outer portions of said valve member, means defining a passage extending axially through said second outer portion of said valve member to intersect said radially extending passage, means defining a bleed passage within said valve body for connecting said inlet passage to said second inner end portion of said valve chamber, a fluid-tight container enclosing a fluid treating media, means for removably connecting said container to said valve body and including a cylindrical outer tube having an outer diameter substantially the same as the inner diameter of said valve chamber and an inner tube spaced concentrically within said outer tube and having an end por-

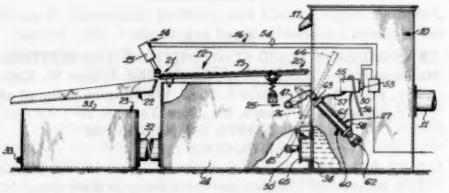
tion positioned to engage said second outer portion of said valve member for removably connecting said end portion of said inner tube to said valve member second outer portion, said passages within said valve member cooperating with said inner and outer tubes to by-pass fluid from said inlet passage through the treating media within said container and then to said outlet passage in response to said valve member being in said first position, said valve member constructed and arranged to block the flow of fluid from said inlet passage through said outer end of said valve chamber in response to said valve member being in said second position when said container is removed, and said valve member being movable between said first and second positions in response to axial movement thereof by said inner and outer tubes being inserted into said outer end portion of said valve chamber.

3,852,197

MUD AND SHALE SEPARATING APPARATUS

James Gordon Thompson, Calgary, Alberta, Canada, assignor to Key Oilfield Supply & Rental Ltd., Calgary, Alberta, Canada

Filed Mar. 16, 1973, Ser. No. 342,128
Claims priority, application Canada, May 31, 1972, 143575
Int. Cl. B01d *33/22*
U.S. Cl. 210—143 **8 Claims**



1. A mud and shale separating apparatus comprising a tank for receiving a mud and shale mixture from a drill hole, a vibrating screen having an infeed end, an outfeed end, said tank having outlet means for permitting a flow of the mixture from said tank onto said infeed end of said screen, motor means for driving said screen and thereby causing the mud to pass through the screen and the shale to be conveyed therealong during operation of said motor means, means for conducting power to said motor means, collecting means below said screen for receiving the mud passed through said screen, passage means defining communication between said tank and collecting means, a door movable between an opened position and a closed position for blocking said passage means, door operating means having an actuator energizable by the power conducting means, said door operating means on de-energization of said actuator permitting said door to move to said opened position whereby the mixture is permitted to flow through said passage means when power is not being conducted to said motor means.

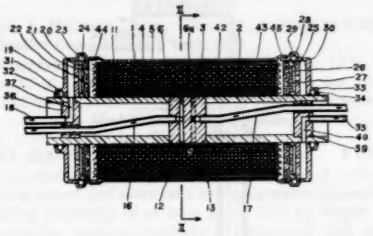
3,852,198

DIALYZING APPARATUS FOR ARTIFICAL KIDNEY

Kenkichi Murakami, Osaka, Japan, assignor to Kabushiki Kaisha Plastic Kogaku Kenkyusho, Osaka-shi, Osaka-fu, Japan

Filed Feb. 12, 1973, Ser. No. 331,531
Claims priority, application Japan, Feb. 12, 1972, 47-15077; Mar. 2, 1972, 47-22126; Mar. 28, 1972, 47-30966
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 **10 Claims**

1. A dialyzing apparatus for an artificial kidney comprising an outer sleeve, a core arranged within the outer sleeve, said core including passage means communicating to the exterior of said outer sleeve, a plurality of tubes made of semipermeable dialyzing membranes in which blood flows, and partition walls interposed between each tube; said tubes being arranged around the core in the peripheral direction, said tubes and partition walls being arranged in parallel to each other around the core spirally, said tubes having inlets and outlets for blood, said inlet and outlets being connected to said passage means,



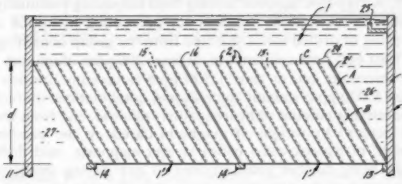
and a passage for dialyzing fluid being formed outside said tubes between an inlet and an outlet for dialyzing fluid at both ends of said outer sleeve and flow adjusting plate means positioned within said outer sleeve at the end thereof for causing a uniform flow of dialyzing fluid through said outer sleeve.

3,852,199

APPARATUS FOR SEPARATING SOLIDS FROM LIQUIDS

William A. Wachsmuth, Mississauga, Ontario, and Anders Lindstol, Oakville, Ontario, both of Canada, assignors to Ecodyne Corporation, Chicago, Ill.

Filed Nov. 17, 1972, Ser. No. 307,319
Int. Cl. B01d *21/10*
U.S. Cl. 210—522 **14 Claims**



1. Apparatus for separating solids from liquids including means defining a plurality of parallel tubes comprising:

a. a member having a series of spaced-apart slot means defined on a first surface thereof;

b. generally flat ribs extending from the opposite surface of said member, each such rib having an edge dimensioned to fit into said slot means;

c. at least two of said members being aligned parallel to each other with the respective slot means on each such member being aligned with corresponding slot means on the other member; and

d. at least three of said ribs each being received in and secured to the slot means of one of said members so as to define with said two members at least two adjacent tubes for receiving a mixture of liquids and solids.

3,852,200

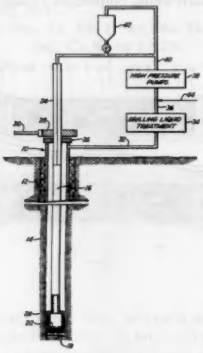
DRILLING LIQUID CONTAINING MICROCRYSTALLINE CELLULOSE

W. Keith Meyer, Indiana Township, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Feb. 8, 1973, Ser. No. 330,567
Int. Cl. C09k *3/14*
U.S. Cl. 252—8.5 A **5 Claims**

1. A drilling liquid for abrasive jet drilling of wells comprising water, microcrystalline cellulose dispersed in the water in a concentration of about 4 to 7 percent by weight of the water,

and ferrous abrasive particles suspended in the dispersion in a concentration of 4 to 20 percent, by bulk volume, of the



dispersion, said microcrystalline cellulose having a level-off degree of polymerization in the range of 40 to 300.

3,852,201

CLAY FREE AQUEOUS DRILLING FLUID

Jack M. Jackson, P.O. Box 35221, Houston, Tex. 77035

Continuation-in-part of Ser. No. 101,177, Dec. 23, 1970, abandoned. This application Mar. 21, 1973, Ser. No. 343,228

Int. Cl. C10m *3/04, 3/02, 3/22, 1/28*

U.S. Cl. 252—8.5 A **8 Claims**

1. A clay-free aqueous drilling fluid consisting essentially of water, an electrolyte inhibitor for preventing hydration and swelling of drilled solids selected from the group consisting of at least 600 ppm calcium ion, at least 200 ppm aluminum ion or chronium ion, at least 1,500 ppm potassium chloride, at least 5,000 ppm sodium chloride and combinations thereof, a viscosifying amount of hydroxyethyl cellulose, and from about 25 percent by weight of magnesia based on the combined weight of hydroxyethyl cellulose and magnesia, said drilling fluid being further characterized as not having thixotropic properties or structured type viscosity and not tending to form a filter cake.

3,852,202

INERT PACKER FLUID ADDITIVE COMPRISING ASBESTOS AND FUMED ALUMINA

Paul C. Wells, and Raymond E. McGlothlin, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 18, 1972, Ser. No. 298,966

Int. Cl. C09k *3/10*

U.S. Cl. 252—8.55 R **9 Claims**

1. A well completion packer fluid additive comprising finely divided asbestos and fumed alumina.

3,852,203

SLIDING BEARING MEMBER

Nobukazu Morisaki, Aichi-ken, Japan, assignor to Daido Metal Company Ltd., Kita-ku, Nagoya, Japan

Filed Dec. 18, 1973, Ser. No. 425,895

Claims priority, application Japan, Aug. 9, 1973, 48-89575

Int. Cl. C10m *5/14, 5/12, 5/10*

U.S. Cl. 252—12 **6 Claims**

1. A sliding member made of a material consisting of 0.1–15 percent by weight of an organic fiber material having a length less than about 3mm. and a diameter of about 15–50 microns and having oil affinity, 1–15 percent by weight of a hydrocarbon lubricating oil, and the balance of polyacetal resin.

3,852,204

LUBRICANT COMPOSITIONS

Georges Jules Pierre Souillard, and Frederic Francois Paul Van Quaethoven, both of Wezembeek-Oppem, Belgium, assignors to Cosden Oil and Chemical Company, Big Spring, Tex.

Continuation-in-part of Ser. No. 555,050, June 3, 1966, abandoned, Continuation-in-part of Ser. No. 73,575, Sept. 18, 1970, Pat. No. 3,753,905, which is a continuation-in-part of Ser. No. 778.858, Nov. 25, 1968, abandoned. This application Sept. 18, 1970, Ser. No. 73,572

Claims priority, application Belgium, Aug. 24, 1966, 23479; Aug. 24, 1966, 23769The portion of the term of this patent subsequent to Aug. 21, 1990, has been disclaimed.

Int. Cl. C10m *1/40*

U.S. Cl. 252—33.4 **7 Claims**

1. A lubricant for internal combustion engines comprising from 10 to 75 percent of liquid polybutene having a viscosity in the range of about 30 up to 600 SSU at 210°F and a molecular weight of less than about 1,000, 5 to 80 percent mineral lubricating oil having a viscosity in the range of about 50 to 1,000 SSU at 100°F, and 3 to 30 percent of a sulfonic acid superbased with an alkaline earth metal selected from the group consisting of calcium, barium and magnesium, the proportions being by weight.

3,852,205

TRANSMISSION FLUID COMPOSITIONS AND METHOD

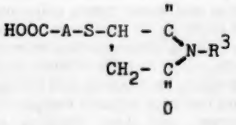
Mahmound S. Kablaoui, Wappingers Falls; Arthur W. Godfrey, Fishkill, and Robert E. Reid, Wappingers Falls, all of N.Y., assignors to Texaco, Inc., New York, N.Y.

Filed Nov. 5, 1973, Ser. No. 413,100

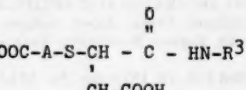
Int. Cl. C10m *1/38*

U.S. Cl. 252—47.5 **12 Claims**

1. A mineral oil composition comprising at least about 50 wt. percent of a mineral lubricating oil and between about 0.01 and 50 wt. percent of a friction modifier selected from the group consisting of S-carboxylalkylene hydrocarbylsuccinimide characterized by the formula:



, S-carboxyalkylene hydrocarbylsuccinamic acid characterized by the formula:



and mixtures thereof where R^3 is alkyl or alkenyl of from 8 to 30 carbon atoms and A is a divalent saturated aliphatic hydrocarbon of from 1 to 16 carbons.

3,852,206

SULFUR HALOGENATED CUTTING OIL AND PROCESS OF MAKING

Robert L. Dinsmore, Long Beach, and Herbert D. Ivey, Pasadena, both of Calif., assignors to Lubrication Company of America, Los Angeles, Calif.

Filed Sept. 10, 1973, Ser. No. 395,742
Int. Cl. C10m *1/38*
U.S. Cl. 252—48.8 **14 Claims**

1. The process which comprises reacting a naphthenic-base mineral oil, boiling between 350°– 1,500°F with about 0.1 percent w. of sulfuric acid, such amount of sulfuric acid being less than the maximum amount required to react completely with the oil, removing the sludge formed thereby, reacting the unneutralized product with a normally liquid, sulfur halide, and separating the resulting precipitate and hydrogen halide therefrom, to leave a stable and homogeneous oil characterized by lack of offensive odor and containing up to about 18 percent w. of total sulfur and up to about 5 percent w. total halide in oil soluble organic compounds which have anti-weld properties.

3,852,207

PRODUCTION OF STABLE LUBRICATING OILS BY SEQUENTIAL HYDROCRACKING AND HYDROGENATION

Bruce E. Stangeland, Berkeley, and Clark J. Egan, Piedmont, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 26, 1973, Ser. No. 345,142
Int. Cl. C10g *31/14, 37/10*
U.S. Cl. 208—58 **10 Claims**

1. A two-stage process for producing a lubricating oil having good UV stability from a hydrocarbon feedstock boiling in the range 700° to 1,200°F., which comprises:

A. catalytically hydrocracking said feedstock in a hydrocracking zone at hydrocracking conditions at a per pass conversion of at least 20 volume percent to materials boiling below the initial boiling point of said feedstock; and

B. catalytically hydrogenating in a hydrogenating zone at least a substantial portion of the effluent from said hydrocracking zone boiling in the range 550°–1,200°F. at hydrogenation conditions including:
a temperature of from 400° to 700°F.,
a pressure of from 1,500 to 5,000 psig,
an LHSV of from 0.2 to 1.5, and
a hydrogen supply rate of from 500 to 20,000 SCF/barrel of said effluent fed to said hydrogenating zone,
in the presence of a hydrogenation catalyst comprising
1. a refractory oxide, and
2. a hydrogenating component comprising a noble metal;
to produce a lubricating oil having good UV stability.

3,852,208

PHOTOCONDUCTIVE TONER COMPOSITION

Shinichiro Nagashima, and Kaichi Tsuchiya, both of Tokyo, Japan, assignors to Canon Inc., Tokyo, Japan

Division of Ser. No. 888,886, Dec. 29, 1969, Pat. No. 3,721,554. This application Dec. 13, 1972, Ser. No. 314,519
Claims priority, application Japan, Dec. 30, 1968, 43-96504; May 12, 1969, 44-36431
Int. Cl. G03g *9/00, 9/02*
U.S. Cl. 252—62.1 **3 Claims**

1. In a toner for developing an electrostatic latent image, the improvement which comprises that the effective component of the toner is the reaction product obtained by condensing

a. an organic photoconductive compound selected from the group consisting of photoconductive polycyclic aromatic compounds having an amino substituent, and photoconductive polycyclic aromatic compounds having an hydroxyl substituent, and

b. a colored substance selected from the group consisting of compounds 35–44 of the specification.

3,852,209

NON-PHOSPHATE AUTOMATIC DISHWASHER DETERGENT

Patricia A. Hofmann, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 133,338, April 12, 1971, Pat. No. 3,701,735. This application June 8, 1972, Ser. No. 260,721The portion of the term of this patent subsequent to Oct. 31, 1989, has been disclaimed.
Int. Cl. C11d *7/54*
U.S. Cl. 252—95 **8 Claims**

1. An alkaline dishwasher detergent capable of inhibiting overglaze attack and essentially free of inorganic phosphates consisting essentially of at least about 25% by weight of a water-soluble aminopolycarboxylic compound and about 30–65% of at least one water-soluble inorganic builder salt selected from the group of silicates, carbonates and borates, about 1–20% sucrose, and about 1–20% overglaze protector.

3,852,210

STABLE LIQUID DETERGENT CONCENTRATES CONTAINING ACTIVE OXYGEN

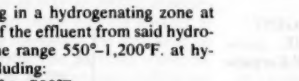
Joseph Z. Krezanoski, Los Altos, Calif., assignor to Flow Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Aug. 11, 1972, Ser. No. 279,801
Int. Cl. C11d *7/54*
U.S. Cl. 252—95 **16 Claims**

1. A stable liquid concentrate composition consisting essentially of:

a. about 0.1 – 50% of an active oxygen yielding compound;

b. about 0.5 – 50% of a water soluble zwitterionic detergent selected from the group consisting of sulfobetaine and betaine surfactants of the formula:



wherein R^2 is a long chain radical and contains an alkyl, alkenyl, or hydroxy alkyl radical of from about 8 to about 24 carbon atoms, from 0 to about 10 ethylene oxide moieties and from 0 to 1 glyceryl moiety; Y is nitrogen; R^1 and R^3 are short chain alkyl or monohydroxy alkyl groups containing 1 to about 3 carbon atoms; x is 0 to 1; R^4 is an alkylene or hydroxy alkylene of from 1 to about 4 carbon atoms; and Z is a radical selected from the group consisting of carboxylate and sulfonate groups;

c. about 1 – 50% of a nonionic polyoxyethylene-polyoxypropylene block copolymer surfactant having a water solubility of at least one gram per 100 ml. of water and a molecular weight within the range of about 1,000 to about 15,000; and

d. 10 – 80% water.

3,852,211

DETERGENT COMPOSITIONS

Tom H. Ohren, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 9, 1972, Ser. No. 279,127
Int. Cl. C11d *9/10, 3/065*
U.S. Cl. 252—110 **17 Claims**

1. A fabric laundering composition comprising

A. granular particles which comprise

i. from about 30% to about 80% by weight of said granular particles of a soap compound, and

ii. from about 1% to about 30% by weight of said granular particles of a soap-curd-dispersing agent; and

B. an impalpable smectite clay having an ion exchange capacity of at least about 50 meq/100 grams, attached to the surface of said granular particles;

said composition having a weight ratio of granular particles to impalpable smectite clay of from about 20:1 to 3:1.

3,852,212

METHOD OF PRODUCING HYDRATED SODIUM TRIPOLYPHOSPHATE COMPOSITION

Harvey F. Groening, and Paul L. Hensler, both of Lawrence, Kans., assignors to FMC Corporation, New York, N.Y.

Filed Nov. 29, 1972, Ser. No. 310,309

Int. Cl. C11d *3/06*

U.S. Cl. 252—135 **3 Claims**

1. In the method of producing hydrated granular sodium tripolyphosphate of low bulk density wherein anhydrous sodium tripolyphosphate feed material, containing at least 10 percent by weight of anhydrous sodium tripolyphosphate having a particle size below 100 mesh, is hydrated with not in excess of 105 percent of the theoretical quantity of water necessary to produce the hexahydrate, and wherein the water is distributed uniformly over said anhydrous feed material while it is being agitated at a rate to keep the hydrating mixture below 80° C and to produce an agglomerated hydrate by the action of the water, grinding the coarse, agglomerated hydrate, separating a particle size range of about −20 to +60 mesh as product, and recycling remaining hydrated sodium tripolyphosphate fines to the feed material, the improvement which comprises adding to said anhydrous sodium tripolyphosphate feed material prior to hydration at least about 2 percent by weight of an alkali metal pyrophosphate and recovering a sodium tripolyphosphate hexahydrate product whose bulk density has been reduced to a range of from 0.65 to 0.71 g/cc.

3,852,213

CHELATING COMPOSITIONS AND DETERGENT COMPOSITIONS PERTAINING TO SAME

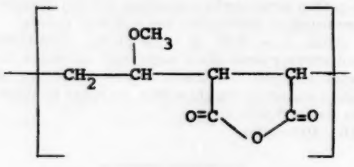
William J. Cooney, Hixson, Tenn., assignor to GAF Corporation, New York, N.Y.

Filed Jan. 12, 1972, Ser. No. 217,225

Int. Cl. C02b *5/00*

U.S. Cl. 252—181 **1 Claim**

1. The method of preparing a chelating composition consisting essentially of 97–70 percent of a polyvinyl methyl ether-maleic anhydride copolymer characterized by the formula:



and having a specific viscosity of from about 0.1 to about 3.5 determined from a solution of 1 g. of the copolymer in 100 ml of methyl ethyl ketone at 25°C and 3–30 percent of a boron compound consisting essentially of a hydrated sodium, lithium or potassium borate sufficient to provide the necessary pH control and furnish water required for hydrolysis of said polyvinyl methyl ether - maleic anhydride copolymer which comprises dry blending between 97–70 percent of said copolymer and between 3–30 percent of said borate to provide an intimate mixture and then dissolving said mixture in water.

3,852,214

LIQUID POLYSULFIDE POLYMER GLASS-TO-METAL SEALANT COMPOSITION

John P. Gallagher, Milton Square, N.J.; Robert M. Meyers, Fairless Hills, Pa.; Earl H. Surg, Trenton, N.J., and Clark M. Willitts, Levittown, Pa., assignors to Thiokol Corporation, Bristol, Pa.

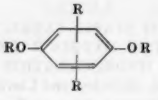
Division of Ser. No. 76,300, Sept. 28, 1970, Pat. No. 3,697,472. This application May 25, 1972, Ser. No. 256,737

Int. Cl. B01j *1/18*

U.S. Cl. 252—403 **5 Claims**

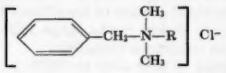
1. An ultraviolet radiation adhesion stabilizing and curing and adhesion rate regulating composition for use with curable systems of liquid polysulfide polymers and metal oxide curing agents comprising in admixture:

a. from about 0.1 to 5 parts by weight per 100 parts by weight of liquid polysulfide polymer of ultraviolet radiation adhesion stabilizer selected from the group consisting of quinone and a composition having the formula



where R is selected from the group consisting of H and an alkyl having from 1 to 6 carbon atoms; and

b. from about 0.1 to 1 part by weight per 100 parts by weight of said polymer of curing and adhesion rate regulator quaternary ammonium chloride represented by the formula



wherein R represents an alkyl containing from 8 to 24 carbon atoms.

3,852,215

CATALYST FOR HYDROCARBON CONVERSION

Pierre Duhaut, Vesinet, and Jean Miquel, Paris, both of France, assignors to Societe Francaise des Products Pour Catalyse, Rueil-Malmaison, France

Filed Dec. 13, 1972, Ser. No. 314,588

Claims priority, application France, Dec. 13, 1971, 71.44781

Int. Cl. B01j *11/78, 11/12*

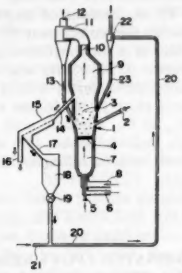
U.S. Cl. 252—441 **10 Claims**

1. A new catalyst containing (a) an alumina carrier, (b) platinum, (c) iridium and (d) at least one metal selected from the group consisting of scandium, yttrium, titanium, zirconium, hafnium and thorium, the catalyst containing from 0.005 to 1% by weight of platinum, from 0.005 to 1% by weight of iridium and from 0.005 to 5% by weight of at least one metal of the group consisting of scandium, yttrium, titanium, zirconium, hafnium and thorium, with respect to the catalyst carrier.

3,852,216
PROCESS FOR PRODUCING COARSE PARTICLES OF ACTIVE CARBON IN A FLUIDIZED BED WITH ADDED INERT PARTICLES

Nobutaka Ninomiya, Kyoto, and Daizo Kunii, Tokyo, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 31, 1972, Ser. No. 285,363
Claims priority, application Japan, Sept. 4, 1971, 46-68417
Int. Cl. C01b *31/08*
U.S. Cl. 252—421 **4 Claims**



1. A process for producing coarse particles of active carbon which consists essentially of continuously supplying to a fluidized bed, particles of carbon or a carbonaceous material from the group consisting of coke, charcoal, and coal having an average particle size of 2 to 20 mm with a finely powdered inert material having a particle size of from 0.05 to 2.0 mm, which inert material does not interfere with the reaction and can be readily separated from the active carbon thus-produced, said inert material being present in an amount of 1 to 4 times by volume of the carbon or carbonaceous particles, introducing a combustion gas, a waste gas or a hot waste gas of a temperature within the range of 600° to 2000°C containing 20 to 80 percent by volume of steam into the mixture of particles and inert material so as to execute the activation or the carbonization and activation of said particles while the mixture is forming a fluidized bed in the reactor, taking out the produced coarse particles of active carbon together with the inert material from the reactor, separating the produced coarse particles of active carbon from the inert material, and recycling said inert particles to said fluidized bed; and wherein in said process both the particles of carbon or carbonaceous material and the inert material are introduced to the lower portion of the fluidized bed and taken out from the upper portion of the fluidized bed to the outside while the gas flows to pass through the fluidized bed from the lower portion to the upper portion.

3,852,217
METHOD OF REGULATING THE HALOGEN CONTENT OF HYDROCARBON CONVERSION CATALYSTS

Philippe Engelhard, and Joseph Edouard Weisang, both of Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Aug. 23, 1972, Ser. No. 283,062
Claims priority, application France, Aug. 26, 1971, 71.31010
Int. Cl. B01j *11/78*
U.S. Cl. 252—442 **17 Claims**

1. A chlorine-stabilized hydrocarbon conversion catalyst consisting essentially of a chlorinated support, said support being a porous refractory oxide, and platinum deposited on said support by impregnation with a solution containing platinum, said catalyst having been over-chlorinated during the impregnation step, thereafter calcinated and then washed with liquid water to remove substantially all the water-extractable chlorides to leave a more stabilized final chlorine content of between 0.5 and 1.2% of the weight of the catalyst, where the percentage of chlorine is calculated on the basis of the elemental form.

3,852,218
$SICL_4$-$ALCL_3$ COCATALYST SYSTEM

Ronald Frank Phillips, New Milford, Conn., assignor to Arizona Chemical Company, Wayne, N.J.

Division of Ser. No. 318,947, Dec. 27, 1972, Pat. No. 3,816,381. This application Oct. 29, 1973, Ser. No. 410,934
Int. Cl. B01j *11/78*
U.S. Cl. 252—442 **2 Claims**

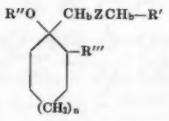
1. A substantially anhydrous cocatalyst system consisting essentially of from 1 to 2 parts of silicon tetrachloride and from 5 to 10 parts by weight of aluminum chloride.

3,852,219
ODORANT COMPOSITIONS INCLUDING 2-BUTYL -1-ALKYNYLCYCLOALKAN-1-OLS AND DERIVATIVES THEREOF

Edward J. Nikawitz, Glen Rock; Robert F. Tavares, Cedar Grove, and William M. Easter, Jr., Hasbrouck Heights, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 88,494, Nov. 10, 1970, Pat. No. 3,769,330. This application May 25, 1973, Ser. No. 363,933
Int. Cl. C11b *9/00*
U.S. Cl. 252—522 **4 Claims**

1. An odorant composition comprising a perfume mixture including an olfactible amount of a compound of the formula



where

R′ is hydrogen or methyl.

R″ is hydrogen or lower alkanoyl

R‴ is butyl

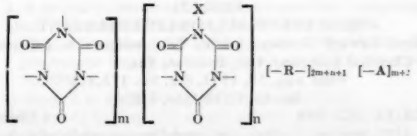
n is 0, 1 or 2; Z is a single, double, or triple bond, and *b* is correspondingly 2, 1, or 0.

3,852,220
ISOCYANURATE-BASED POLYELECTROLYTE DETERGENT COMPOSITION

Albert L. Kimmel, Kansas City, Mo.; Perry A. Argabright, Larkspur, and C. Travis Presley, Littleton, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Jan. 12, 1972, Ser. No. 217,223
Int. Cl. C07d *55/00;* **C08g** *22/04;* **C11d** *3/28*
U.S. Cl. 252—524 **6 Claims**

1. An improved detergent composition consisting essentially of at least about 2 to about 70 weight percent of a surfactant and about 2 to about 20 weight percent of an isocyanurate-based polyelectrolyte, wherein said isocyanurate-based polyelectrolyte has the following chemical structure:



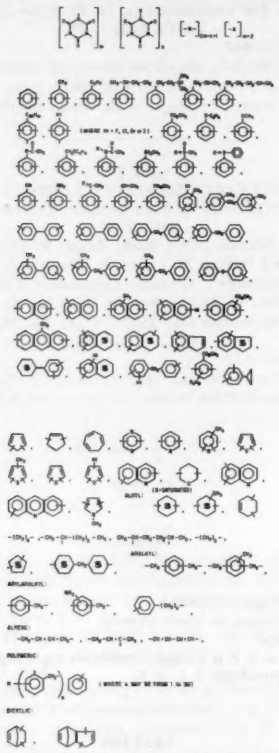
wherein:

R = divalent hydrocarbon or substituted hydrocarbon radical and contains about 2 to about 30 carbon atoms selected from the groups of FIGS. 2 and 3

X = a monovalent radical selected from the group consisting of: Li, Na, K, Rb, Cs, Ca, Ag, Be, Mg, Ca, Sr, Ba, Ra, Zn, Cd, Hg, B, Al, Ac, Ga, In, Tl, Ti, Zr, Hf, Ge, Sn, Pb, V, Nb, Ta, Sb, Bi, Cr, Mo, W, Mn, Fe, Ru, Co, Ni, Rh, Pd, Ir, hydrogen and quaternary ammonium groups,

A = a monovalent organic radical,

R' = monovalent hydrocarbon or substituted hydrocarbon radical,



m = average number of trisubstituted isocyanurate rings and is a positive integer from 0 to about 400,

n = average number of isocyanuric acid and/or isocyanurate salt groups, and is a positive integer from 1 to about 10,000,

2m +n +1 = average number of divalent R groups and is a positive integer from 2 to about 110,000,

m + 2 = average number of A groups and is a positive integer from 2 to about 2,000,

and wherein there are no N-to-N bonds, no A-to-A bonds, and no R-to-R bonds.

3,852,221

LIQUID OLEFIN SULFONATE DETERGENT

Floyd Edward Bentley, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Aug. 19, 1971, Ser. No. 173,314
Int. Cl. C11d *1/14, 1/831*
U.S. Cl. 252—548 **6 Claims**

1. A detergent composition consisting essentially of a clear homogeneous liquid of (A) 19 to 30 wt. percent of an olefin sulfonate component; (B) 8 to 15 wt. percent of an alcohol ether sulfate component; (C) 3 to 7 wt. percent of a substituted fatty acid amide component; (D) 1 to 8 wt. percent of a sulfonated hydrotrope component; (E) 1 to 8 wt. percent of a monohydric water-miscible alcohol; and (F) 32 to 68 wt. percent water; wherein said component (A) consists essentially of (1) 7 to 60 wt. percent of a C_{14} alpha-olefin sulfonate, and (2) 93 to 40 wt. percent of a vinylidene-olefin sulfonate, wherein said vinylidene-olefin sulfonate (2) consists essentially of C_{14} or C_{16} vinylidene-olefin sulfonate, and admixtures thereof, provided however that the total amount of said vinylidene olefin sulfonate component (2) shall not exceed 80 wt. percent of said component (A) when said vinylidene-olefin sulfonate contains 95 wt. percent or more C_{16} vinylidene-olefin sulfonate; wherein said component (B) is a sulfated 2 to 5 mole polyethoxylate of a monohydric C_{10} to C_{18} alcohol; wherein said component (C) is a fatty acid monoethanolamide, a fatty acid isopropanolamide, a fatty acid diethanolamide, or a fatty acid glyceryl amide and wherein the fatty acid portion is a C_{10} to C_{16} aliphatic acid, and admixtures thereof, and wherein said component (D) is an alkali metal salt of xylene sulfonate, toluene sulfonate, benzene sulfonate, or admixtures thereof.

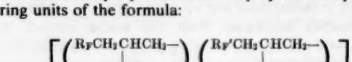
3,852,222

FLUORINATED EPOXY RESINS

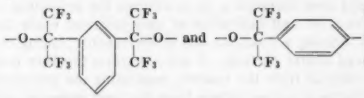
Donald E. Field, Falls Church, Va., and James R. Griffith, Riverdale Heights, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 25, 1973, Ser. No. 373,322
Int. Cl. C08g *22/14, 30/02*
U.S. Cl. 260—2 EP **10 Claims**

1. A random epoxy-terminated copolymer comprising recurring units of the formula:



wherein R_F is selected from the group consisting of



R_F' is $-OCH_2(CF_2)_zCH_2O-$ z being an integer from about 2 to 12; *x* is an integer from 1 to about 4, and *y* is an integer from 0 to about 4, with proviso that *y* is not always equal to 0.

3,852,223

PROCESS FOR DISPOSING OF HALOGEN-CONTAINING PLASTICS

Reinhard D. Bohme, Burr Ridge, Ill., and Ritchie A. Wessling, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 3, 1972, Ser. No. 268,466
Int. Cl. C08f *47/24, 9/00*
U.S. Cl. 260—2.3 **4 Claims**

1. In the process of disposing of vinylidene chloride polymers by incineration wherein the polymer is preheated to dehydrohalogenation temperatures the improvement comprising the sequential steps of (1) preparing an admixture of vinylidene chloride polymer and catalytic amounts of a Lewis acid, (2) degassing said mixture, (3) heating said mixture under vacuum or in an inert atmosphere at a temperature of at least about 70°C. to produce a substantially linear, soluble, conjugated polymer of chloroacetylene among other chlorine-containing by-products, then (4) removing said polymer of chloroacetylene and said other halogen-containing by-products by extraction thereof in an organic solvent.

3,852,224
MICROPOROUS FILMS

Douglas J. Bridgeford, Champaign, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Sept. 14, 1972, Ser. No. 289,197
Int. Cl. C08f *47/08;* **C08b** *29/12;* **C08c** *17/12*
U.S. Cl. 260—2.5 M **16 Claims**

1. In a process for forming a microporous solid polymer in which said polymer is solidified in admixture with a finely dispersed poreformer which is subsequently leached therefrom, the improvement which comprises solidifying said polymer in admixture in a liquid medium with a poreformer surfactant material finely dispersed as micelles and treating said solidified polymer with a solvent in which said polymer is substantially swollen and in which said micelles revert to molecular size whereby the micellar poreformer is leached out producing a microporous structure comprising a plurality of pores of the size of micelles or micelle aggregates.

3,852,225
POLYMER COMPOSITION HAVING HIGH FLOW PROPERTY

Narimasa Ishikawa, Tokyo; Susumu Suzuki; Yasuhiro Ougusa, both of Yokohama, and Koozo Arai, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1973, Ser. No. 423,827
Claims priority, application Japan, Dec. 14, 1972, 47-125532
Int. Cl. C08c *9/04, 11/22;* **C08d** *9/04*
U.S. Cl. 260—5 **13 Claims**

1. A polymer composition having a high flow property, which comprises 100 parts by weight of a polymer component consisting of at least one polybutadiene having a 1,2-addition unit content of 70 percent or higher, a crystallinity of 5 to 50 percent, and an intrinsic viscosity of 0.7 dl/g or higher as measured in toluene at 30°C., or a polymer component consisting of a major amount of at least one said polybutadiene and a minor amount of a rubbery polymer co-vulcanizable therewith; 1 to 200 parts by weight of a filler; and up to 200 parts by weight of a process oil.

3,852,226
MELT-CONDENSED POLYAMIDE INTERPOLYMERS

Jerome William Sprauer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 208,930, Dec. 16, 1971, Pat. No. 3,784,495. This application Apr. 19, 1973, Ser. No. 352,740The portion of the term of this patent subsequent to Jan. 25, 1989, has been disclaimed.
Int. Cl. C08g *20/04*
U.S. Cl. 260—18 N **9 Claims**

1. A melt-condensed polyamide interpolymer consisting essentially of at least four different recurring polyamide repeat units in which

a. 35 to 55 percent of the amide equivalents are polymethylene-ω-aminoacid repeat units of six to 20 carbon atoms,
b. 10 to 30 percent of the amide equivalents are diamine diacid repeat units in which the diamine is polymethylene diamine of six to 20 carbon atoms and the diacid is polymethylene diacid of six to 20 carbon atoms,
c. 10 to 30 percent of the amide equivalents are diamine diacid repeat units in which the diamine is polymethylene diamine of six to 20 carbon atoms and the diacid is polymethylene diacid of six to 20 carbon atoms different from the diacid of (b) above, and
d. 10 to 30 percent of the amide equivalents are diamine diacid repeat units in which the diamine is polymethylene diamine of six to 20 carbon atoms and the diacid is polymethylene diacid of six to 20 carbon atoms different from the diacids of (b) and (c) above,

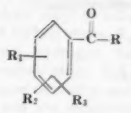
said polyamide interpolymer having a crystalline heat of fusion of 3 to 15 calories per gram and melting completely at 125° C.

3,852,227
PHOTO-DEGRADABLE POLYOLEFIN RESIN COMPOSITION

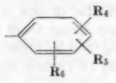
Hisayuki Matsuda, Kyoto; Hirohumi Mori, Osaka, and Hajime Matoba, Nara, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 27, 1972, Ser. No. 318,777
Claims priority, application Japan, Dec. 28, 1971, 47-2182
Int. Cl. C08f *45/00*
U.S. Cl. 260—23 H **15 Claims**

1. A photo-degradable polyolefin comprising (A) a polyolefin and (B) 0.2 to 10 parts by weight per 100 parts by weight of said polyolefin, of a photo-degrading agent consisting of (a) 5 to 70% by weight, based on the photo-degrading agent of, at least one carbonyl compound expressed by the following formula



wherein R is a member selected from the group consisting of lower alkyl groups which may be substituted by halogen, lower alkoxy or nitro and which may be bonded to the carbon atom at the ortho-position of the benzene nucleus of formula (I) directly or via —CO— to form a fused ring, and groups expressed by the following formula



with the proviso that the carbon atom adjacent to the carbon atom bonded to —CO— in formula (I) may be bonded to the carbon atom at the ortho-position of the benzene nucleus of formula (I) directly or via —CO—; and R_1, R_2, R_3, R_4, R_5 and R_6, which may be the same or different, represent a member selected from the group consisting of hydrogen, halogen, hydroxyl, lower alkyl, lower alkoxy and nitro, with the proviso that when at least one of R_1, R_2, R_3, R_4, R_5 and R_6 is a hydroxyl group, said hydroxyl group is not bonded to the carbon atom of the benzene nucleus adjacent to the carbon atom of the benzene nucleus bonded to the —CO— group in formula (I):

and (b) 30 to 95 percent by weight, based on the photo-degrading agent, of at least one compound selected from the group consisting of aliphatic carboxylic acids having 6 to 20 carbon atoms, and zinc, magnesium, aluminum, calcium and barium salts of said aliphatic carboxylic acids.

3,852,228
THIXOTROPIC COATING COMPOSITION

Don R. Brothers, 3857 Fairway Dr., Canfield, Ohio

Continuation-in-part of Ser. No. 104,455, Jan. 7, 1971, abandoned. This application Dec. 1, 1972, Ser. No. 311,265
Int. Cl. C08d *9/08*
U.S. Cl. 260—23.7 M **13 Claims**

1. A sprayable thixotropic coating composition comprising:

a. about 3 to about 15 weight percent of butyl rubber;
b. about 3 to about 15 weight percent polybutene, said polybutene having a molecular weight of at least about 50,000;
c. about 2 to about 30 weight percent drying oil;
d. about 13 to about 25 weight percent aromatic solvent,
e. about 4 to about 23 weight percent of pigment; and
f. up to about 2 weight percent of a drier.

3,852,229
STABILIZATION OF POLYBUTADIENE RESIN

Delmar F. Lohr, Jr., and Edward L. Kay, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 31, 1973, Ser. No. 393,516
Int. Cl. C08c *11/72*
U.S. Cl. 260—23.7 M **7 Claims**

1. Process of producing a resin having a high resistance to thermo-oxidative deterioration of its mechanical properties, which process comprises subjecting to curing at 250° to 420°F. a composition containing

	Parts by Weight
A butadiene homopolymer or copolymer resin	100
Bis(dihydrocarbylthionophosphonato) di-, tri- or tetrasulfide	0.5 – 5.0
Calcium stearate	0.5 – 5.0
A peroxide curing agent	0.5 – 6.0
Silica	100 to 500
Vinyl triacetoxysilane	0.05 – 5.0

the resin being a homopolymer of butadiene or a copolymer of butadiene and styrene and containing at least 40% by weight of butadiene, and at least 80% of butadiene repeating units in the homopolymer or copolymer being in the 1,2-configuration; the curing agent being a peroxide which gives radicals of the structure $R_2(CH_3)O.$ in which each R represents a hydrocarbon radical of one to 20 carbon atoms, and each hydrocarbyl group being from the class consisting of alkyl groups containing one to eight carbon atoms and aryl groups containing 12 to 16 carbon atoms.

3,852,230
IMPREGNATING COMPOSITIONS FOR FIBROUS SHEET MATERIALS FROM POLYURETHANE AND OLEFIN COPOLYMER

Eduard Muck, Otrokovice; Jaroslav Strachota, Veseli nad Moravou, and Josef Horak, Gottwaldov, all of Czechoslovakia, assignors to Statni vyzkumny ustav Kozedelny, Gottwaldov, Czechoslovakia

Filed Sept. 2, 1971, Ser. No. 177,493
Claims priority, application Czechoslovakia, Oct. 14, 1970, 6906-70
Int. Cl. C08h *13/06*
U.S. Cl. 260—28 **3 Claims**

1. An aqueous liquid composition for impregnating flexible sheet materials of fibrous character consisting essentially of a mixture of about 100 parts of a polyurethane made from hydroxyl poly (tetramethylene oxide), butanediol-1,4, and diphenyl methane—p,p'—diisocyanate to about 5–50 parts of a copolymer having a molecular weight of from about 400 to 3,000 and formed from (a) about 1–20 molar percent of an olefinic monomer having two to four carbon atoms and (b) about 99 to 80 molar percent of a second olefinic monomer having the general formula:

(I)

wherein R is a radical selected from the group consisting of linear C_{4-20} alkyl radicals and carbo-cyclic radicals having the ability to combine with an alkyl radical, said olefinic monomers consisting essentially of hydrocarbon units.

3,852,231
HOT MELT, WATER REMOISTENABLE ADHESIVE COMPOSITION

John W. Huebschmann, Youngstown, and Joseph D. Peperone, Cheektowaga, both of N.Y., assignors to Moore Business Forms, Inc., Niagara Falls, N.Y.

No Drawing. Filed June 2, 1972, Ser. No. 259,193
Int. Cl. C08f *45/52*, *45/42*, *45/32*
U.S. Cl. 260—28.5 R **16 Claims**

1. A hot-melt, water remoistenable adhesive composition consisting essentially of an admixture of:

a. 30 to 60 parts by weight of a water sensitive vinyl pyrrolidone-vinyl acetate copolymer wherein the weight ratio of the vinyl pyrrolidone moiety to the vinyl acetate moiety is between about 3:1 and 1:3;

b. 10 to 55 parts by weight of a plasticizer material therefor, and as an additional component,

c. 10 to 40 parts by weight of a wax component selected from the group consisting of Hoechst Wax S, peat wax and lignite wax.

3,852,232
RESIN COMPOSITION AND PROCESS FOR BOND SOLID PARTICLES

Richard C. Bowman, Andborn; Edward J. Lang, Grand Island, and Frank S. Grazen, North Tonawanda, all of N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 880,397, Nov. 26, 1969, abandoned, which is a continuation-in-part of Ser. Nos. 517,423, Dec. 29, 1965, Pat. No. 3,539,484, and Ser. No. 813,702, April 4, 1969, abandoned. This application June 30, 1972, Ser. No. 267,824
Int. Cl. C08g *51/24*
U.S. Cl. 260—29.3 **22 Claims**

1. In a process for bonding discrete solid particles which comprises admixing said particles with an aqueous resin binder composition and a curing accelerator selected from the group consisting of acids and salts to yield a wet mixture, and heating the resulting wet mixture to effect setting of the resinous components;

the improvement comprising employing a resinous binder composition prepared by reacting a urea composition selected from the group consisting of a urea-formaldehyde and a thiourea-formaldehyde having a molar ratio of urea and/or thiourea to formaldehyde in the range of about 1:2 to about 1:5 and which has been heated at a temperature in the range of about 50 to 100 degrees centigrade at a pH of about 5 to 6, with a phenol and formaldehyde in the presence of an alkaline catalyst at a temperature of at least about 100 degrees centigrade, said phenol and added formaldehyde employed in a molar ratio in the range of about 0.25:1 to 1:1 to produce a resin binder composition having a total molar ratio of urea and/or thiourea to formaldehyde of about 1:4 to about 1:8, and a water tolerance of at least 50 percent.

3,852,233
THERMOSETTING VINYL ESTER-ETHYLENE EMULSION COPOLYMERS

Martin K. Lindemann, Greenville, S.C., assignor to Chase. S. Tanner Co., Greenville, S.C.

Continuation-in-part of Ser. No. 142,406, May 11, 1971, abandoned. This application Mar. 12, 1973, Ser. No. 340,536
Int. Cl. C08f *45/24*
U.S. Cl. 260—29.6 TA **14 Claims**

1. An aqueous emulsion comprising an aqueous medium having colloidally suspended therein an emulsion copolymer consisting essentially of from 5–40 percent of ethylene, from 0.5–15 percent of monomers providing thermosetting characteristics and consisting essentially of a formaldehyde adduct with an allyl carbamate providing N-methylol functionality, and at least 40 percent of vinyl ester with a saturated aliphatic monocarboxylic acid.

3,852,234
PROCESS AND APPARATUS FOR DISSOLVING WATER SOLUBLE POLYMERS AND GUMS IN WATER INVOLVING INVERSION OF WATER-IN-OIL EMULSIONS

Gerard J. Venema, Oak Park, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Feb. 28, 1972, Ser. No. 229,827
Int. Cl. C08f *47/16, 47/18*
U.S. Cl. 260—29.6 H **5 Claims**

1. In the process of dissolving water soluble vinyl addition polymers and gums in water wherein a water-in-oil emulsion which contains finely divided water soluble vinyl addition polymer or gum is inverted in water whereby the water soluble vinyl addition polymer or gum is released into the water as a solution, the improvement which comprises adding water to said water-in-oil emulsion in sufficient amount so that the resultant composition has a viscosity approximating that of water alone, and passing a confined stream of the resultant composition with a Reynolds number of at least 50,000 for an average residence time less than one second in a tortuous or winding path under conditions sufficient to produce turbulence and to cause said water-in-oil emulsion to invert and to release said polymer or gum in water to produce an aqueous activated solution of said polymer or gum after said stream leaves said tortuous or winding path, said activated solution having a higher viscosity than the viscosity of said emulsion in said confined stream.

3,852,235
MELT EXTRUDABLE POLYACETYLENE COPOLYMER BLENDS

Charles M. Krutchen, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 86,280, Nov. 2, 1970, abandoned. This application Apr. 20, 1973, Ser. No. 352,923
Int. Cl. C08f *45/28, 19/20;* **C01b** *31/07*
U.S. Cl. 260—32.4 **2 Claims**

1. Polyacetylene blends which are melt extrudable at temperatures of from 100° to 180°C, comprising by weight (A) from 20 to 50 percent by weight of polyacetylene having an intrinsic viscosity of 0.5 to 1.5 in ortho-dichlorobenzene at 120°C in the form of a copolymer consisting essentially of from 80–92 mole percent of metadiethynylbenzene units and 8–12 mole percent of paradiethynylbenzene units, and (B) from 80 to 50 percent of organic solvent selected from the class consisting of para-dichlorobenzene, ortho-dichlorobenzene, nitrobenzene and halogenated aryl hydrocarbons having an average weight percent of chlorine from about 12–75 percent based on the total weight of halogen, carbon and hydrogen, where said blends can be in the form of a free flowing powder, a wet granulated mixture or paste.

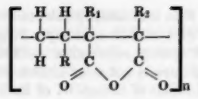
3,852,236
HOMOGENEOUS THERMOSETTABLE COMPOSITION OF A POLYANHYDRIDE AND A POLYEPOXIDE

William J. Heilman, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

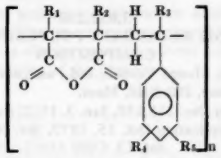
Continuation-in-part of Ser. No. 100,418, Dec. 21, 1970, abandoned. This application Aug. 9, 1972, Ser. No. 278,967
Int. Cl. C08f *37/18, 37/00*
U.S. Cl. 260—42.18 **12 Claims**

1. A method of preparing a handleable, thermosettable, moldable composition which comprises the steps

forming a liquid solution consisting essentially of a polyanhydride represented by the general formula



or



wherein *n* is between 2 and about 500, R is hydrogen, halogen or a straight chain alkyl or halogenated alkyl group having from 1 to 18 carbon atoms, R_1 and R_2 are independently selected from hydrogen, halogen, alkyl having from one to four carbon atoms and phenyl, R_3 is hydrogen, chlorine, bromine or methyl and R_4 and R_5 are on an aromatic nucleus and are independently selected from hydrogen, chlorine, bromine, lower alkyl having from one to four carbon atoms, methoxy and ethoxy;

an olefinically unsaturated monooxirane compound containing as its only functional groups a single oxirane oxygen atom and an olefinic double bond capable of being polymerized by free radical means; and optionally

an olefinically unsaturated monomer free of oxirane oxygen atoms and containing as its only functional groups at least one olefinic double bond capable of polymerization by free radical means; and

polymerizing at least a portion of said olefinic double bonds of said olefinically unsaturated monooxirane compound and said olefinically unsaturated monomer by using a chemical free radical initiator at a temperature up to about 70° C. without substantial polymerization of the anhydride groups and the epoxide groups present in the mixture whereby a handleable, thermosettable, moldable composition comprising a homogeneous mixture of polyanhydride molecules, polyepoxide molecules and any unreacted olefinically unsaturated monooxirane compound and olefinically unsaturated monomer is obtained.

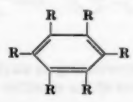
3,852,237
CLEARER POLYEFINS BY COMBINATION OF ARYL CARBOXLIC ACID PHTHALOCYANINE, AND QUINACRIDONE

Charles W. Osborn, and Paul B. Milam, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 8, 1972, Ser. No. 287,251
Int. Cl. C08f *45/14*
U.S. Cl. 260—42.21 **8 Claims**

1. A polyolefin composition characterized by low haze and high light transmission comprising at least one polyolefin and a nucleating amount of each of (I) at least one aryl carboxylic acid compound, (II) at least one phthalocyanine, and (III) at least one quinacridone,

wherein said aryl carboxylic acid compound is a mono or dicarboxylic aryl hydrocarbon acid or Group IA or IIA metal salt thereof and wherein at least one carboxylic acid group is attached to the aryl ring represented by



wherein each R is individually selected from hydrogen, or alkyl of up to 4 carbon atoms per R group such that at least one R group represents —COOM, the total of —COOM groups is not over 2, and M represents hydrogen or said metal of Group IA or IIA.

3,852,238
FLAME RETARDANT POLYCARBONATE COMPOSITION

John B. Luce, Mount Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 215,155, Jan. 3, 1972, Pat. No. 3,796,772. This application Oct. 15, 1973, Ser. No. 406,602

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 R **3 Claims**

1. A flame retardant polymer composition comprising mixtures of a carbonate polymer and 0.01 – 2.0 weight percent of calcium titanate, said polycarbonate composed of a copolymer of an unsubstituted dihydric phenol and halogen substituted dihydric phenol; said halogen being selected from the group consisting of bromine and chlorine.

3,852,239
ADAMANTANE BASE POLYBENZOXAZOLE

Gunter Gert Bellmann, Geneve; Alain Maurice Groult, Annemasse, and John Harry Arendt, Collonge-bellerive, all of France, assignors to Etat Francais, represente par le Ministre d'Etat Charge de la Defense Nationale-Delegation Ministerielle Pour l'Armement-Direction des Researches et Moyens d'Essais, Paris, France

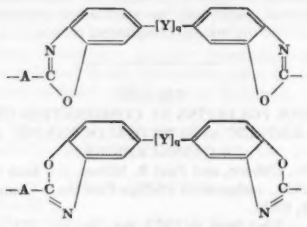
Filed June 21, 1973, Ser. No. 372,043

Claims priority, application France, June 21, 1972, 72.22291

Int. Cl. CO8g *33/02*

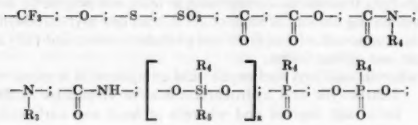
U.S. Cl. 360—46.5 R **1 Claim**

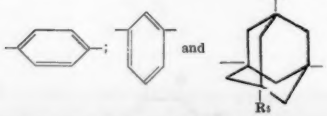
1. Polybenzoxazole consisting essentially of recurrent units forming macromolecular chains and being of one of the two following formulas:



in which

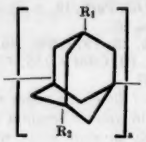
Y represents one of the following atoms or groups:



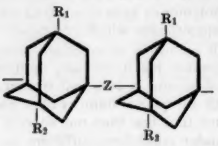


R_4 and R_5 each representing an alkyl or alkoxy group with 20 carbon atoms at the most, or a phenyl or phenoxy group, and x is a whole number equal to 3 at the most; q is 0 or 1;

A is a divalent organic group having one of the two following formulas:



or

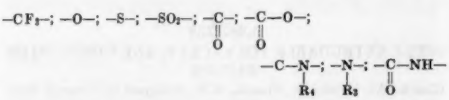


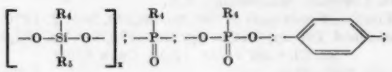
wherein

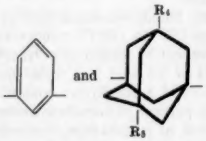
a is a whole number equal at the most to 3,

R_1 and R_2 each represent an atom or group selected from among the following: H, alkyl with at the most 20 carbon atoms, CF_3, $Si(R_3)_3$, adamantyl, phenyl, alkoxy with 20 carbon atoms at the most, $O\text{-}Si(R_3)_3$, R_3 being a phenyl radical or an alkyl radical with 20 carbon atoms at the most, and

Z represents one of the following atoms or groups:







R_4 and R_5 each representing an alkyl or alkoxy group having 20 carbon atoms at the most, or a phenyl or phenoxy group, and x is a whole number equal to 3 at the most.

3,852,240
RAPID SETTING FORMALDEHYDE-EPOXY RESIN COMPOSITIONS

Harry A. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 18, 1973, Ser. No. 324,738

Int. Cl. C08g *30/04, 30/14*

U.S. Cl. 260—47 EP **10 Claims**

1. A room temperature stable epoxy resin composition comprising

A. an epoxy resin having an average of more than one glycidyl ether group per molecule and

B. formaldehyde, linear or cyclic polymers thereof, or an adduct of formaldehyde with a compound containing a plurality of aliphatic hydroxyl groups;

wherein the weight ratio of epoxy resin:formaldehyde is from about 3.6:1 to about 36:1 and wherein component B is dissolved in a solvent selected from water, alcohols, or monoethers of ethylene polyglycols and propylene polyglycols.

3,852,241
AROMATIC COPOLYAMIDES CONTAINING QUINAZOLINEDIONE RINGS AND THREADS THEREOF WITH HIGH MODULUS OF ELASTICITY AND HIGH TENSILE STRENGTH

Gerhard Dieter Wolf; Hans Egon Kunzel, both of Dormagen; Gunter Blankenstein, Stommeln, and Francis Bentz, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

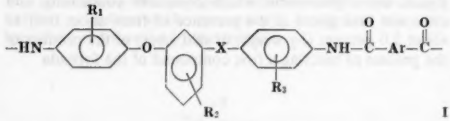
Filed Oct. 4, 1973, Ser. No. 403,390

Claims priority, application Germany, Oct. 4, 1972, 2248663

Int. Cl. C08g *20/20*

U.S. Cl. 260—47 CZ **7 Claims**

1. A high-molecular weight aromatic copolyamide, consisting essentially of 50 to 95 mols-% of structural units of the general formula I



I

in which

X represents the group

or

R_1 and R_2 are independent of each other and represent hydrogen, a C_1–C_4 alkoxy group, an alkyl group or halogen atom,

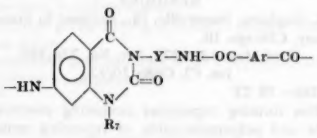
R_3 represents hydrogen, halogen, a C_1–C_4 alkyl group, an alkoxy group, a nitrile group, a $—COOR_4—$ or a $CONR_5R_6$ group,

Ar represents a divalent aromatic group,

R_4 representing hydrogen or a C_1–C_4 alkyl group and

R_5 and R_6 representing, independently of each other, hydrogen, a C_1–C_4 alkyl group or an aryl group,

and 5 - 50 mols-% of structural units which contain 2,4-(1H,3H)-quinazolinedione ring systems, which structural units are represented by the following general formula II



II

in which

R_7 represents hydrogen or a C_1–C_4-alkyl group,

Y represents a bivalent aromatic group, consisting of one or more condensed aromatic rings or aromatic rings which are joined together by a single bond or by a —CO—, $—CR_7R_7—$, —O— —S— or $—SO_2—$ group, and their alkyl substitution or halogen substitution products, and

Ar represents a divalent aromatic group,

the copolyamides having a relative solution viscosity ($\eta_{rel.}$ determined on a 0.5 % solution of the copolyamide in concentrated sulphuric acid at 25°C) of 1.4 to 4.

3,852,242
METHOD FOR MAKING POLYETHERIMIDE

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

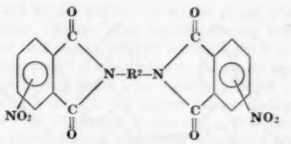
Filed Dec. 3, 1973, Ser. No. 421,262

Int. Cl. C08g *20/32*

U.S. Cl. 260—47 CZ **7 Claims**

1. A method for making polyetherimide which comprises,

1. effecting reaction at temperatures up to 80°C in the presence of a dipolar aprotic solvent between a bis-(nitrophthalimide) of the formula,



where R^2 is a divalent aromatic radical, and at least an equal molar amount of an alkali metal diphenoxide to form polyetherimide,

2. effecting the precipitation of the polyetherimide from the resulting reaction mixture, and

3. recovering the polyetherimide from (2), where said alkali metal diphenoxide is the dry powder reaction product of a sodium alkoxide and a dihydric phenol in the presence of a $C_{(1-3)}$ alkanol.

3,852,243
POLYPHENYLQUINOXALINES CONTAINING LATENT CROSSLINKING GROUPS

Paul M. Hergenrother, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

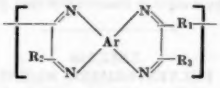
Continuation-in-part of Ser. No. 287,407, Sept. 8, 1972, Pat. No. 3,778,412, which is a continuation-in-part of Ser. No. 139,884, May 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 846,576, July 31, 1969, abandoned. This application July 23, 1973, Ser. No. 381,913

Claims priority, application Great Britain, Aug. 21, 1972, 38828/72

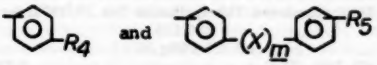
Int. Cl. C08g *33/02*

U.S. Cl. 260—50 **36 Claims**

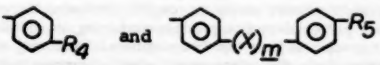
1. Polymers comprising units of the formula



wherein Ar is a tetravalent aromatic group, R_1 is a divalent aromatic group and R_2 and R_3 are individually selected from the group



wherein *m* is 0 or 1, X is —O—, —S—, $—CH_2—$ or



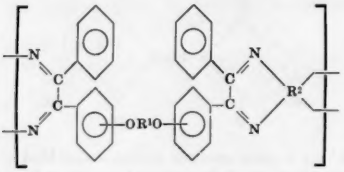
and R_4 and R_5 are —CN or —OCN.

3,852,244
POLYETHERQUINOXALINES

Darrell R. Heath, Overland Park, Kans., and Joseph G. Wirth, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 23, 1973, Ser. No. 418,250
Int. Cl. C08g *33/02*
U.S. Cl. 260—50 **8 Claims**

1. Moldable polymeric materials having recurring quinoxaline groups and an intrinsic viscosity of from 0.1 to 2.0 in chloroform at 25°C consisting essentially of the following chemically combined units



where R^1 is a divalent aromatic radical having from 6-30 carbon atoms, and R^2 is a tetravalent aromatic organic radical.

3,852,245
LOW TEMPERATURE EPOXY RESIN CURING AGENT COMPRISING BLEND OF AN ANHYDRIDE MIXTURE, AN ANHYDRIDE HALF ESTER, AND URANYL SALT

Norman W. Gregornik, Minneapolis, and Frank D. Swanson, Hopkins, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 185,861, Oct. 10, 1971, abandoned. This application June 14, 1973, Ser. No. 370,076
Int. Cl. C08g *30/06*, *30/12*
U.S. Cl. 260—59 **1 Claim**

1. A composition which is useful with material sensitive to shock, extreme temperature or chemical attack comprising an epoxy novolac resin, which is cured with a curing agent at a temperature less than 170°F, and said curing agent comprising an eutectic mixture of 30.8 percent by weight chlorendic anhydride, 23.1 percent by weight maleic anhydride and 46.1 percent by weight methyl tetrahydrophthalic anhydride which is partially reacted to the corresponding half ester by reaction with dipropylene glycol and a catalyst comprising uranyl acetylacetonate dispersed in said glycol such that from 50 percent to 80 percent by weight is dissolved in said glycol.

3,852,246
POLYESTERIMIDE RESINS

Karl Schmidt, and Gerhard Neubert, both of Hamburg, Germany, assignors to Dr. Beck & Co. GmbH, Hamburg, Germany

Continuation of Ser. No. 18,373, March 12, 1970, abandoned, which is a continuation of Ser. No. 706,187, Feb. 16, 1968, abandoned, which is a continuation of Ser. No. 458,746, May 25, 1965, abandoned. This application Feb. 29, 1972, Ser. No. 230,535
Int. Cl. C08g *20/32*
U.S. Cl. 260—75 N **8 Claims**

1. In a process for the preparation of a heat-hardenable polyesterimide resin which comprises the steps of reacting at least one polybasic carboxylic acid or reactive derivative thereof with at least one polyhydric alcohol and at least one polyvalent primary amine or reactive derivative thereof to form a polycondensation product containing, in addition to ester groups, at least one five-membered imide ring in the polymer chain, the improvement which comprises carrying out the reaction of the starting materials to form said polycondensation product in the presence of a surplus of at least one lower molecular weight, volatile glycol, said surplus being at least 2 mol glycol per ester group present in said polycondensation product, at least a part of the surplus of said glycol being separated off after the polycondensation has been effected.

3,852,247
POLYMERIZATION CATALYST

Louis Vizurraga, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Division of Ser. No. 86,302, Nov. 2, 1970, Pat. No. 3,758,535, which is a continuation-in-part of Ser. No. 879,618, Nov. 24, 1969, abandoned. This application May 11, 1973, Ser. No. 359,178
Int. Cl. C08g *17/015*
U.S. Cl. 260—75 R **29 Claims**

1. In a process for preparing a polyester comprising condensing a lower dialkyl ester of a dicarboxylic acid with a glycol, the improvement which comprises condensing said ester and said glycol in the presence of from about 0.01 to about 2.0 percent (by weight of said ester) of the product of the process of reacting a first compound of the formula

with a second compound of the formula

wherein:

a. M is selected from the group consisting of aluminum, germanium, tin, titanium, zirconium, arsenic, antimony, and bismuth;

b. R_2 and R_4 are selected from the group consisting of chlorine and hydroxy;

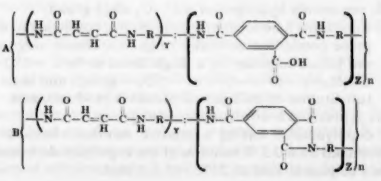
c. The remaining R substituents are selected from the group consisting of alkyl of 1 to about 18 carbon atoms, acyl of 1 to about 18 carbon atoms, alkoxy of 1 to about 18 carbon atoms, aryl of 6 to about 18 carbon atoms, aryloxy of 6 to about 18 carbon atoms, and hydrogen, provided that at least one of R_5, R_6, R_7, and R_8 is not hydrogen; and d. in said reaction from about 0.1 to about 20 moles of said second compound per mole of said first compound are reacted, for from about 1.0 to about 6 hours.

3,852,248
FILM FORMING POLYAMIDE COMPOSITION CONTAINING FUMARIC ACID AND TRIMELLITIC ACID RESIDUES

James R. Stephens, Naperville, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Mar. 13, 1972, Ser. No. 234,395
Int. Cl. C08g *20/32*
U.S. Cl. 260—78 TF **3 Claims**

1. A film forming copolymer consisting essentially of a polyamide and polyamide-imide of repeating units of the formula:



wherein → indicates isomerism, R is a divalent aromatic carbocyclic radical, and Y is the mole fraction of the fumaric acid diamido moiety and Z is the mole fraction of the aromatic acid diamido moiety in the polymer chain and the ratio of Y:Z ranges from 20:1 to 0.05:1 and *n* is an integer greater than 5.

3,852,249

ANTISTATIC AGENT FOR POLYMERIC MATERIALS

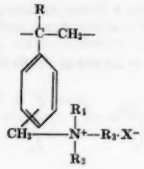
Yoshio Miyabe, Ibaragi; Takehiko Fujimoto, Kyoto; Shogo Nukina, and Ataru Suwada, both of Osaka, all of Japan, assignors to Oji Yuka Goseishi Kabushiki Kaisha, Tokyo and Sanyo Chemical Industries, Ltd., Kyoto-fu, both of, Japan

Filed Mar. 5, 1973, Ser. No. 338,184

Int. Cl. C08f *15/40, 27/08*

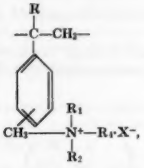
U.S. Cl. 260—78.5 R **14 Claims**

1. A water-soluble antistatic agent for polymeric materials, said antistatic agent comprising a water-soluble polymer containing, as indispensable components, constituent units respectively represented by the formula



(1)

and the formula



(2)

Where:

R is hydrogen atom or an alkyl group having at the most 4 carbon atoms;

R_1, R_2, and R_3 are independently alkyl groups each having at the most 4 carbon atoms;

R_4 is an alkyl group having at least 16 carbon atoms; and

X^- is an anion,

and a constituent unit obtained from a copolymerizable carboxylic acid or a salt thereof.

3,852,250

VULCANIZATION SYSTEM CONTAINING A THREE-COMPONENT ACCELERATOR SYSTEM

Frank S. Maxey, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 18, 1972, Ser. No. 245,263

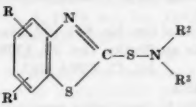
Int. Cl. C08c *11/62;* **C08d** *9/00;* **C08f** *27/06*

U.S. Cl. 260—79.5 B **8 Claims**

1. A sulfur vulcanizable rubber containing 0.00 to 3.25 parts by weight of free sulfur per 100 parts by weight of rubber and 0.5 to 5.50 parts by weight per 100 parts by weight of rubber, of an accelerator system comprising

A. 2-(morpholinodithio)-benzothiazole,

B. at least one benzothiazole accelerator having the following structural formula



wherein R and R^1 are selected from the group consisting of hydrogen, nitro, chloro, alkyl radicals having from 1 to 4 carbon atoms and alkoxy radicals having from 1 to 4 carbon atoms and wherein R^2 is selected from the group consisting of alkyl radicals having from 1 to 6 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms, aralkyl radicals having from 7 to 13 carbon atoms and aryl radicals having from 6 to 12 carbon atoms, wherein R^3 is selected from hydrogen and the radicals for R^2 and R^2 and R^3 can be joined through a member selected from the group consisting of —CH_2—, —O— and —S— to constitute with the attached nitrogen group a heterocyclic radical and

C. 4,4′-dithiomorpholine

wherein the weight ratio of A/B/C is 20 to 70/10 to 60/10 to 60 based on 100 parts by weight of A, B and C, and wherein the total weight of sulfur plus accelerator system is from 2.25 to 5.50 parts by weight per 100 parts by weight of rubber.

3,852,251

TWO-COMPONENT ACCELERATOR SYSTEM FOR VULCANIZABLE RUBBERS

Frank S. Maxey, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 18, 1972, Ser. No. 245,264

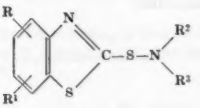
Int. Cl. C08c *11/62;* **C08d** *9/00;* **C08f** *27/06*

U.S. Cl. 260—79.5 B **7 Claims**

1. A sulfur vulcanizable rubber containing 0.10 to 3.25 parts by weight of free sulfur per 100 parts by weight of rubber and 0.5 to 3.25 parts by weight per 100 parts by weight of rubber, of an accelerator system comprising

A. 2-(morpholinodithio)-benzothiazole, and

B. at least one benzothiazole accelerator having the following structural formula



wherein R and R^1 are selected from the group consisting of hydrogen, nitro, chloro, alkyl radicals having from 1 to 4 carbon atoms and alkoxy radicals having from 1 to 4 carbon atoms and wherein R^2 is selected from the group consisting of alkyl radicals having from 1 to 6 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms, aralkyl radicals having from 7 to 13 carbon atoms and aryl radicals having from 6 to 12 carbon atoms, wherein R^3 is selected from the group consisting of hydrogen and the radicals for R^2, and R^2 and R^3 can be joined through a member selected from the group consisting of —Ch_2— and —S— to constitute with the attached nitrogen group a heterocyclic radical wherein the weight ratio of A/B is ⅔ to 4/1, and wherein the total weight of sulfur plus accelerator system is from 2.25 to 5.50 parts by weight per 100 parts by weight of rubber.

3,852,252
PURIFICATION OF HIGH MOLECULAR WEIGHT POLYMERS TO REDUCE HYDROGENATION CONDITIONS

Albert N. DeVault, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum company, Bartlesville, Okla.

Continuation of Ser. No. 811,197, March 27, 1969, abandoned. This application Oct. 26, 1970, Ser. No. 84,154

Int. Cl. C08d *5/02*

U.S. Cl. 260—85.1 **3 Claims**

1. A method for hydrogenating an unsaturated butadiene/styrene copolymer, which comprises:

a. dispersing said butadiene/styrene copolymer in a hydrocarbon solvent, thereby forming a solution of said copolymer and said solvent,

b. contacting said solution from said step (a) with a molecular sieve having an effective pore diameter of from about 8 to about 12 Angstrom units, under substantially anhydrous conditions at a temperature of from about 0° to 150° F., a pressure of from about 0 to 500 psig, and a space velocity of from about 0.1 to 50 liquid volumes per volume of said molecular sieve per hour, and

c. hydrogenating the treated solution from said step (b), wherein the said hydrogenation step (c) is conducted with a nickel octoate-triethylaluminum catalyst.

3,852,253
HETEROGENEOUS PROCESS FOR PREPARING CONJUGATED DIENE BUTYL

Alberto Malatesta, Brussels, Belgium, assignor to Esso Research and Engineering Company, Linden, N.J.

Filed Dec. 22, 1972, Ser. No. 317,715

Int. Cl. C08d *3/04, 13/32*

U.S. Cl. 260—85.3 H **11 Claims**

1. A heterogeneous process for preparing a copolymer consisting of from 85 to 99.5 percent by weight of an isoolefin having from 4 to 7 carbon atoms, combined with 15 to 0.5 percent by weight of a conjugated diolefin having from 4 to 14 carbon atoms, containing in the linear backbone conjugated diene unsaturation, which comprises contacting a solution of said copolymer which has been halogenated, in a reaction zone, with a metal salt of a strong acid wherein said metal is selected from the metals of Group II*a* or II*b* of the Periodic Table; provided, however, that said salt is not a Friedel-Crafts catalyst, there being at least 1 part by weight salt present for contact with 100 parts by weight of said halogenated copolymer, at a temperature of from 100° to 220°C., for a time sufficient to dehydrohalogenate said halogenated copolymer, and recovering the copolymer having a reduced halogen content, which is characterized by having random units of conjugated diene unsaturation.

3,852,254
ACRYLONITRILE-(CO)-POLYMERS WITH REDUCED SURFACE RESISTANCE

Eduard Radlmann, and Gunther Nischk, both of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

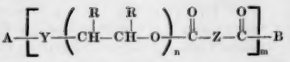
Filed May 18, 1973, Ser. No. 361,528

Claims priority, application Germany, June 10, 1972, 2228362

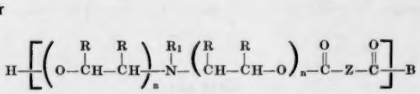
Int. Cl. C08f *3/76, 15/22, 45/54*

U.S. Cl. 260—85.5 R **6 Claims**

1. A composition of matter comprising (A) an acrylonitrile polymer selected from the group consisting of an acrylonitride homopolymer and a copolymer containing at least 60 percent by weight of polymerized acrylonitrile, and (B) 1 – 20 percent by weight, based on the total composition, of an antistatic agent of the formula



or



in which

n is an integer of from 1–100;

m is an integer of from 1–150;

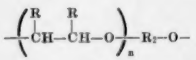
R is hydrogen or methyl;

A is hydrogen or a radical of the formula R_1-O—,

or

in which R_1 represents a linear or branched chain aliphatic group containing 1–30 carbon atoms, aryl, alkylaryl or arylalkyl;

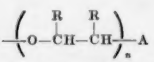
Y is a single bond or a radical of the formula



in which R and *n* have the above meanings and R_2 is a straight chain or branched chain alkylene containing 1–20 carbon atoms, arylene, or a radical of the formula

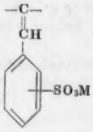
in which R_3 represents a single bond or a straight chain or branched chain alkylene containing 1–20 carbon atoms or arylene;

B is —O-R_1, or

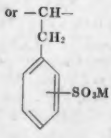


in which R, R_1, A and *n* have the above meanings, and

Z is a radical of the formula



or



in which M is an alkali metal or alkaline earth metal.

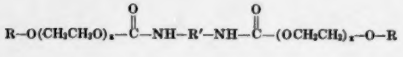
3,852,255

SHAPED STRUCTURES OF ACRYLONITRILE POLYMERS CONTAINING ANTISTATIC ADDITIVES

Francis Bentz, Cologne; Dieter Brokmeier, Dormagen; Ulrich Reinehr, Dormagen, and Gunther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 13, 1974, Ser. No. 442,202
Claims priority, application Germany, Feb. 13, 1973, 2306920
Int. Cl. C08f 3/76, 15/22, 45/60
U.S. Cl. 260—88.7 R 6 Claims

1. A shaped structure consisting of from 85 to 99.5 percent by weight of an acrylonitrile polymer containing at least 60% by weight of acrylonitrile in polymerized form and as an antistatic agent of from 0.5 to 15 % by weight of a polyether diurethane compound of the general formula



in which

R represents a C_{1-18} -alkyl, cycloalkyl, aryl, aralkyl or alkaryl radical, said radicals being halogen- or alkylsubstituted or not,

x is an integer of 5 to 50, and

R' is a bivalent alkyl or aryl or aralkyl or alkaryl or cycloalkyl radical.

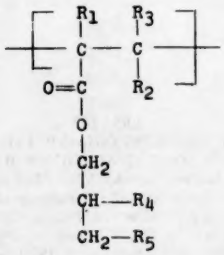
3,852,256

PHOTOPOLYMERS

Edward H. Parker, Ballwin; Edward M. Harris, Webster Groves, and Jim D. Meador, Bridgeton, all of Mo., assignors to Western Litho Plate & Supply Co., St. Louis, Mo.

Filed July 18, 1972, Ser. No. 272,796
Int. Cl. C08f 3/64, 3/66, 15/16
U.S. Cl. 260—89.3 12 Claims

1. A light-sensitive polymer susceptible to crosslinking upon exposure to actinic light, containing at least about 10% by weight of the recurring unit:



wherein R_1, R_2, and R_3 are each selected from the group consisting of hydrogen, halogen, and lower alkyl and at least one of R_4 and R_5 is selected from the group consisting of azidobenzoyloxy and azidonaphthoyloxy, the other of R_4 and R_5 being selected from the group consisting of hydroxyl, halogen, alkoxy, aryloxy, aralkoxy, alkoxyalkoxy, aryloxyalkoxy, alkoxyaryloxy, aryloxyaryloxy, alkylacyloxy, arylacyloxy, alkenylacyloxy, aralkenylacyloxy, heterocyclic substituted alkenylacyloxy, azidobenzoyloxy and azidonaphthoyloxy.

3,852,257

SUSPENSION POLYMERIZATION IN THE PRESENCE OF XANTHAN GUM

Henry G. Hartnek; Richard A. Empey; David J. Pettitt, all of San Diego, Calif., and Terry L. Van Winkle, Mount Prospect, Ill., assignors to Kelco Company, San Diego, Calif.

Filed Feb. 5, 1973, Ser. No. 329,522
Int. Cl. C08f 3/62
U.S. Cl. 260—89.5 AW 7 Claims

1. In the process for the aqueous suspension polymerization of a liquid monomer to a particulate polymer, where the monomer is acrylic acid or its polymerizable derivatives, methacrylic acid or its polymerizable derivatives, esters or ethers of vinyl alcohol, vinylidene chloride, styrene or methylstyrene, the method for obtaining particulate polymer of essentially uniform particle size that comprises conducting the polymerization in the presence of from about 0.1 to 4.0 percent by weight of xanthan gum.

3,852,258

PROCESS FOR PREPARING POLYOLEFIN SUBSTITUTED AMINES

Roy B. Flay, Concord, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 18, 1972, Ser. No. 316,331
Int. Cl. C08f 27/08, 27/02
U.S. Cl. 260—93.7 5 Claims

1. In a process for the preparation of a hydrocarbylamine by contacting a polyolefin containing more than 30 carbon atoms with chlorine in an inert medium at a temperature of from about −40° to about 105°C to form a chlorinated polyolefin and hydrogen chloride, and contacting a volatile primary or secondary amine having a boiling point below about 200°C at atmospheric pressure with said chlorinated polyolefin at a temperature of from about 65° to 200°C to form a mixture comprising hydrocarbylamine, unreacted volatile amine and HCl, the improvement which comprises the more complete separation of said volatile amine from said mixture by contacting said mixture with a fluid amine having a boiling point at least about 5°–40°C greater than the boiling point of said volatile amine at the same pressure prior to stripping said mixture.

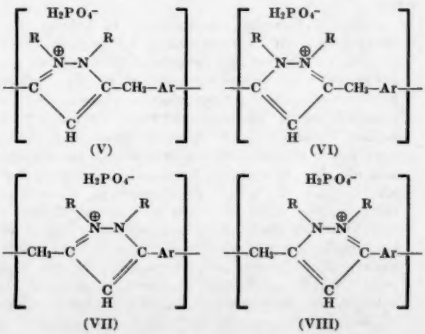
3,852,259

PHOSPHATES OF PYRAZOLE POLYMERS

William J. I. Bracke, Hamme, Belgium, assignor to Labotina, S.A., Brussels, Belgium

Filed Nov. 21, 1973, Ser. No. 417,943
Int. Cl. C08f 9/00
U.S. Cl. 260—94.1 10 Claims

1. Polymer compositions having a molecular weight above 1,000 and made up of repeating units distributed at random having the formula:



wherein R is selected from the group consisting of hydrogen and monovalent hydrocarbonyl radicals and Ar is a phenylene radical.

3,852,260

PROCESS FOR PREPARING FISH PROTEIN USING PROPANOL OR BUTANOL

Tryggve Lund Knutsen, Motellvagen, and Sven-Olof Osterman, Havrekornsgatan, both of Sweden, assignors to Astra Nutrition Aktiebolag, Molndal, Sweden

Filed Feb. 2, 1973, Ser. No. 329,205

Claims priority, application Great Britain, Feb. 4, 1972, 5419/72

Int. Cl. A23j *1/04*

U.S. Cl. 260—112 R **5 Claims**

1. In a process for preparing a substantially fat-free tasteless and odorless protein from fresh fish, wherein fish material in fresh condition is subjected to disintegration, boiling, deboning, separation, pressing and partial dewatering, whereby bones, stick water and certain fats are removed and wherein the fish material thereafter is stored in an air and gas impervious container, and thereafter the fish material is subjected to extraction for removing fat, and taste- and order-producing substances with one or more solvents selected from the group consisting of solvents which can remove or substantially remove fat and taste- and order-producing substances from fish material and which group consists of isopropanol, n-butanol, sec-butanol and isobutanol, the improvement which comprises said dewatering being to a water content 12 to 20 percent by weight, and mixing said dewatered material prior to said storage with a member of said group of solvents in an amount of 10 to 30 percent by weight of such solvent calculated on the amount of said water retained in the material.

3,852,261

5-ARYLAZO-6-HYDROXYPYRIDONE-2 DYES BEARING A CATIONIC GROUP IN THE 3-POSITION

Willy Steinemann, Basel, Switzerland, assignor to Sandoz Ltd., Basle, Switzerland

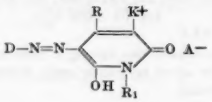
Filed , Ser. No. 87,602

Claims priority, application Switzerland, Dec. 7, 1969, 16561/69; Dec. 23, 1969, 19042/69; Aug. 13, 1970, 12175/70; Aug. 18, 1970, 12339/70

Int. Cl. C09b *29/36, 31/14;* **D06p** *3/76*

U.S. Cl. 260—156 **35 Claims**

1. A compound of the formula



wherein

D is phenyl, naphthyl, anthraquinonyl, 2-thiazolyl, 2-benzothiazolyl or 1,2,4-triazolyl, or a substituted derivative thereof, wherein each substitutent of each substituted derivative is independently lower alkyl, lower alkoxy, halo, nitro, cyano, trifluoromethyl, phenyl, lower alkanamidophenyl, phenoxy, chlorophenoxy, benzyloxy, anilino, nitroanilino, dinitroanilino, lower alkanoyl, benzoyl, lower alkylbenzoyl, carbamoyl, dilower alkylcarbamoyl, phenylcarbamoyl, N-(dilower alkylamino lower alkyl)carbamoyl, lower alkoxycarbonyl, dilower alkylaminolower alkanoyl, lower alkanamido, dilower alkylaminolower alkanamido, lower alkoxycarbonylamino, benzamido, lower alkylsulfonyl, phenylsulfonyl, chlorophenylsulfonyl, benzylsulfonyl, phenoxysulfonyl, sulfamoyl, lower alkylsulfamoyl, dilower alkylsulfamoyl, phenylsulfamoyl, chlorophenylsulfamoyl, N-phenyl-N-lower alkylsulfamoyl, naphthylsulfamoyl, N-(dilower alkylaminolower alkyl) carbamoylphenyl, phenylazo, nitrophenylazo, chlorophenylazo, chloro-nitrophenylazo, lower alkylphenylazo, lower alkoxyphenylazo, dilower alkylaminophenylazo, lower alkanamidophenylazo, phenylazophenylazo, phthalimido, 2-oxopyrrolidinyl-1, 2-oxo-1,3-oxazolidinyl-1 or 6-lower alkylbenzothiazolyl-2;

K^+ is pyridinium, quinolinium, isoquinolinium, quinoxalinium, thiazolium, pyrimidinium, imidazolium, pyrazinium, benzoimidazolium, benzotriazolium, benzothiazolium, triazolium, tetrazolium, thiadiazolium, indazolium, or 3-oxopyrazolinium, or a substituted derivative thereof, wherein each substitutent of each substituted derivative is independently lower alkyl, lower alkoxy, chloro, bromo, cyano, lower hydroxyalkyl, benzyl, phenyl or dilower alkylcarbamoyl;

R is hydrogen, lower alkyl, monosubstituted lower alkyl, phenyl, furyl, pyridyl, lower alkoxycarbonyl or

wherein the substituent of monosubstituted lower alkyl is lower alkoxy, lower alkoxycarbonyl, lower alkylsulfonyl, cyano, phenoxy, phenyl, dilower alkylcarbamoyl, phenylcarbamoyl or pyrrolidinocarbonyl, and

each of R_{14} and R_{15} is independently hydrogen, alkyl of 1 to 6 carbon atoms, monosubstituted lower alkyl, phenyl, tolyl or lower alkoxy, wherein the substituent of monosubstituted lower alkyl is hydroxy, phenyl, lower alkoxycarbonyl, lower alkoxy, cyano, morpholino, piperazino, tetrahydrofuryl or dilower alkylamino, or

R_{14} and R_{15} taken together and with the nitrogen to which they are bound are pyrrolidino, piperidino, N'-lower hydroxyalkylpiperazino, hydrazino, N'-lower hydroxyalkylhydrazino or N',N'-dilower hydroxyalkylhydrazino;

R_1 is hydrogen, alkyl of 1 to 8 carbon atoms, monosubstituted lower alkyl, phenyl, chlorophenyl, tolyl, N,N-dimethylaminophenyl, anilinophenyl, diphenyl, lower alkylcarbamoyl, amino, dilower alkylamino, lower hydroxyalkylamino, pyrrolidino, morpholino, N-lower alkylpiperazino, pyridyl, tetrahydrofuryl, lower alkylthiazolyl or N-lower alkylpyrrolidinium $^+A^-$, wherein the substituent of monosubstituted lower alkyl is lower alkoxy, hydroxy, dilower alkylamino, lower hydroxyalkylamino, dilower hydroxyalkylamino, cyano, phenyl, lower alkoxycarbonyl, piperazino, N-lower alkylpiperazino, morpholino, pyridinium $^+A^-$ or N,N-dilower alkylhydrazinium $^+A^-$, and

A^- is an anion.

3,852,262

METHOD OF REDUCING ORGANIC COMPOUNDS BY MEANS OF SODIUM- ALUMINUM HYDRIDES

Jaroslav Vit; Bohuslav Casewsky; Milan Mamula, all of Prague, and Jiri Marchacek, Rez, all of Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

Division of Ser. No. 594,971, Nov. 10, 1966, Pat. No. 3,652,662. This application Jan. 8, 1970, Ser. No. 7,308

Claims priority, application Czechoslovakia, Nov. 13, 1965, 6771-65; Mar. 26, 1966, 2009-66; Mar. 26, 1966, 2010-66

Int. Cl. C07b *29/00*

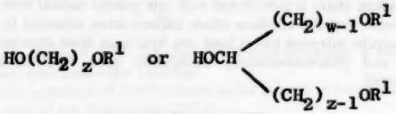
U.S. Cl. 260—205 **16 Claims**

1. In the method of reducing ketones, esters, carboxylic acid halides, and dialkylamides to alcohols and aromatic nitro compounds to azo compounds by reaction of the said compounds in an organic solvent with a reducing agent at an elevated temperature, the improvement which comprises effecting the said reduction in solution in an organic solvent with a reducing agent that is soluble in the said organic solvent, the

said reducing agent being a substituted sodium aluminum hydride having the formula $NaAlH_xQ_{4-x}$ in which x is an integer from 1 to 3 and Q is an organic radical derived by the removal of an active hydrogen atom from

a. a tetrahydrofurfuryl alcohol,

b. a tetrahydropyranyl alcohol, c. an ether alcohol having the formula



in which R^1 is alkyl containing 1 to 4 carbon atoms or phenyl and w and z are each integers from 2 to 4,

d. a polyether alcohol having the formula $HO(CH_2)_zO(CH_2)_wOR^1$ in which formula members w, z and R^1 have the same significance as hereinbefore, or

e. an amino alcohol having the formula $R''R'''N(CH_2)_zOH$ is which R'' and R''' each have the same significance as the R^1 radical hereinbefore, or an alkoxyalkyl radical having the formula $R^1O(CH_2)_z$, in which formula R^1 and z have the same significance as hereinbefore.

3,852,263

SUBSTITUTED 4-(N-SULPHOALKYLENE-AMINOSULPHONYL)-PHENYL-AZO-PHENYL COMPOUNDS

Edgar Siegel, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

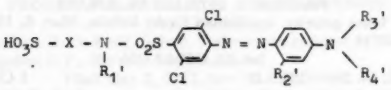
Filed Jan. 14, 1972, Ser. No. 217,961

Claims priority, application Germany, Jan. 15, 1971, 2101685

Int. Cl. C09b *29/08*

U.S. Cl. 260—205 **8 Claims**

1. Monoazo dyestuff, which in the form of a free acid, has the formula



in which X is alkylene with 2 to 4 carbon atoms;

R_1' and R_2' are hydrogen or methyl;

R_3' is methyl, ethyl or propyl; and

R_4' is methyl, ethyl, propyl or benzyl.

3,852,264

GENTAMICIN C OXAZOLIDINE DERIVATIVES

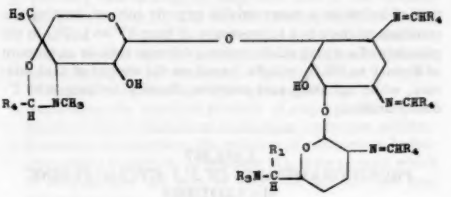
Jay Weinstein, Bloomfield, N.J., and David Cooper, Swedeland, Pa., assignors to Schering Corporation, Bloomfield, N.J.

Continuation-in-part of Ser. No. 852,948, Aug. 25, 1969, abandoned. This application Jan. 7, 1972, Ser. No. 216,263

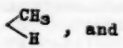
Int. Cl. C07c *47/18*

U.S. Cl. 260—210 AB **7 Claims**

1. A composition of matter having the structural formula:



wherein R_1 is hydrogen or methyl; R_3 is $R_4HC=$ or



and R_4 is an organic radical.

3,852,265

2',3'-O-LOWER ALKYLIDENE OR CYCLOHEXYLIDENE PERIPLORHAMNOSIDE COMPOUNDS

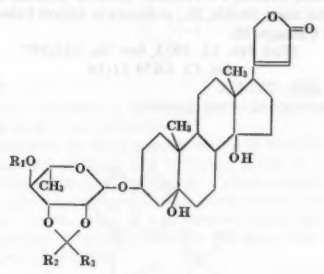
Johannes Hermann Hartenstein, Wittental, and Gerhard Satzinger, Im. Mattenbuhl, both of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 5, 1972, Ser. No. 295,384

Int. Cl. C07c *173/00*

U.S. Cl. 260—210.5 **6 Claims**

1. Periplorhamnoside derivatives of the formula:



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wherein R_1 is selected from the group consisting of hydrogen, methyl, ethyl, methoxy-methyl, ethoxy-methyl, and the acyl residue of a carboxylic acid with 1 to 5 carbon atoms; and wherein R_2 and R_3 taken individually are lower alkyls, or taken together is a 5 or 6 membered alicyclic ring.

3,852,266

PROCESS FOR PRODUCING 5-IODO-DEOXY-URIDINE

Tetsuo Kiyanagi; Morio Suzuki, and Hiroshi Yoshino, all of Choshi, Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Chiba-ken, Japan

Filed Dec. 22, 1971, Ser. No. 211,098

Claims priority, application Japan, Dec. 24, 1970, 45-116709

Int. Cl. C07d *51/52*

U.S. Cl. 260—211.5 R **5 Claims**

1. A process for producing 5-iodo-deoxy-uridine which consists essentially of admixing a solution of 2'-deoxy-uridine in water or a mineral acid selected from the group consisting of nitric acid, sulfuric acid and hydrochloric acid with a solu-

tion of iodine in a water soluble organic solvent, heating the resultant mixture at a temperature of from 85° to 110°C in the presence of a strong acidic cation exchange resin in an amount of from 1 to 5% by weight, based on the weight of said mixture, while agitating said mixture, thereby iodizing said 2'-deoxy-uridine.

3,852,267

PHOSPHORAMIDATES OF 3',5'-CYCLIC PURINE NUCLEOTIDES

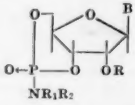
Rich B. Meyer, Jr., Laguna Beach; Dennis A. Shuman, Mission Viejo, and Roland K. Robins, Santa Ana, all of Calif., assignors to ICN Pharmaceuticals, Inc., Pasadena, Calif.

Filed Aug. 4, 1972, Ser. No. 277,972

Int. Cl. C07d *51/52, 51/54*

U.S. Cl. 260—211.5 R **11 Claims**

1. A 9-(β-D-ribofuranosyl) purine 3',5'-cyclic phosphoramidate of structure



wherein R is hydrogen or acyl, B is adenine, guanine or, when R is acyl, N^6-acyladenine or N^2-acylguanine, and wherein R_1 and R_2 are alkyl groups joined to form a six-membered heterocyclic ring or, independently, hydrogen or C_1–C_5 alkyl, each acyl moiety being C_1–C_{18} acyl.

3,852,268

INOSINE-5 -CARBOXYLIC ACID AMIDES

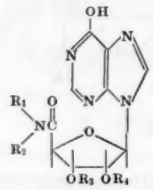
Raj Nandan Prasad, Pierrefonds, Quebec, Canada, and Herman Hal Stein, Skokie, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 12, 1973, Ser. No. 331,397

Int. Cl. C07d *51/54*

U.S. Cl. 260—211.5 R **6 Claims**

1. A compound of the formula



wherein R_1 and R_2 each are selected from the group consisting of hydrogen, loweralkyl, lowerhaloalkyl, lowerhydroxyalkyl, lowercycloalkyl, loweralkylcycloalkyl, loweralkenyl or loweralkynyl; and R_3 and R_4 each are hydrogen, loweralkanoyl, or R_3 and R_4 taken together form an isopropylidene or benzylidene moiety, and the pharmaceutically acceptable salts thereof.

3,852,269

DIPHENYLALKYLLACTAMIMIDE DERIVATIVES

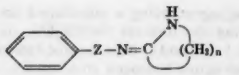
Johann Martin Grisar, and Robert Douglas MacKenzie, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

Filed Apr. 18, 1972, Ser. No. 245,195

Int. Cl. C07d *41/04, 25/00*

U.S. Cl. 260—239 B **10 Claims**

1. A compound selected from a base of the formula



wherein *n* is a positive whole integer of from 3 to 7; Z is selected from the group consisting of a straight or branched divalent alkylene chain of from two to six carbon atoms wherein any one of the carbon atoms one through six of said alkylene chain is substituted with one phenyl radical with the proviso that the alkylene chain carbon atom adjacent to the exocyclic nitrogen has at least one hydrogen atom attached to it; and pharmaceutically acceptable acid addition salts thereof.

3,852,270

PROCESS FOR THE PREPARATION OF 7-CHLORO-5-PHENYL-3H-1,4-BENZODIAZPINE-2-(1H)ONE

Antonio Ziggiotti, Vezia Ticino, Switzerland; Giovanna Riva, Milan, and Francesco Mauri, Sesto San Giovanni, both of Italy, assignors to Ravizza S.A., Lausanne, Switzerland

Filed Mar. 1, 1972, Ser. No. 230,993

Claims priority, application Great Britain, Mar. 5, 1971, 6138/71

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 D **1 Claim**

1. Process for the preparation of 7-chloro-5-phenyl-3H-1,4-benzodiazepine-2(1H)one characterized in that:

a. 2-chloroacetamido benzophenone is cyclized with ammonia in the presence of dimethylsulphoxide, at a temperature of 50–100° C. and

b. the thus obtained 1,3-dihydro-5-phenyl-2H-1,4-benzodiazepine-2-one is selectively chlorinated in the 7-position with chlorine in the presence of nitro-benzene as the solvent.

3,852,271

PROCESS FOR THE PREPARATION OF 7-CHLORO-BENZODIAZEPINE DERIVATIVES

Antonio Ziggiotti, Vezia Ticino, Switzerland; Francesco Mauri, and Giovanna Riva, both of Milano, Italy, assignors to Ravizza S.A., Lausanne, Switzerland

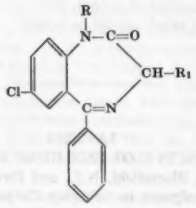
Filed Mar. 1, 1972, Ser. No. 230,994

Claims priority, application Great Britain, Mar. 5, 1971, 6140/71

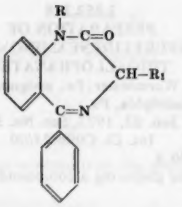
Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 D **1 Claim**

1. A process for the preparation of a 7-chloro-benzodiazepine-2-one of the formula



wherein R = H, CH_3; R_1 = H, OH, $OCOCH_3$, characterized in that a benzodiazepine of the formula



wherein R and R_1 have the above indicated meanings, is chlorinated with elemental chlorine

in the presence of nitrobenzene as the solvent at a temperature of not higher than 20° C.

3,852,272

PROCESS FOR REMOVING LACTAMS

Abraham Hermanus DeRooij, Geleen, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands

Filed May 2, 1972, Ser. No. 249,642

Claims priority, application Netherlands, May 7, 1971, 7106343

Int. Cl. C07d *41/06*

U.S. Cl. 260—239.3 A **5 Claims**

1. In a process for recovering lactam from a mixture of lactam and sulphuric acid, said process comprising countercurrently extracting lactam from said mixture with a water-immiscible organic lactam solvent, the improvement comprising partly neutralizing and diluting said mixture of lactam and sulphuric acid by the addition of ammonia and water, wherein the amount of ammonia added is such that the molar ratio

$$(NH_4)_2SO_4/(NH_4)_2SO_4 + H_2SO_4$$

in the resulting partially neutralized solution is about 0.30:1 to 0.65:1, and wherein the amount of water added is between about 3 and about 10 moles of water per mole of sulphur trioxide originally present in the form of free sulphur trioxide and in the form of sulphur trioxide bound as sulphuric acid and, after the lactam is removed from the mixture, thermally decomposing the remainder of the mixture to produce a gas containing SO_2 and/or SO_3.

3,852,273

PROCESS FOR PREPARING AND RECOVERING LACTAMS

Abraham H. De Rooij, Geleen, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands

Filed May 2, 1972, Ser. No. 249,727

Claims priority, application Netherlands, May 7, 1971, 7106341; Nov. 3, 1971, 7115110

Int. Cl. C07d *41/06*

U.S. Cl. 260—239.3 A **5 Claims**

1. A process for preparing lactams without requiring the substantial addition or discharge of sulphuric acid or other sulfur-containing compounds to the process, said process comprising the following steps:

a. reacting a first amount of SO_2, ammonium hydroxide and ammonium nitrite to form a solution of ammonium hydrogen sulfate and hydroxylammonium sulfate,

b. neutralizing the reaction mixture in step (a) above with ammonia to form a solution of ammonium sulfate and hydroxylammonium sulfate,

c. reacting the neutralized product obtained in step (b) with a ketone and additional ammonia to produce the corresponding ketoxime and a solution of ammonium sulfate,

d. separating the ketoxime from the ammonium sulfate solution of step (c),

e. making oleum from a second amount of SO_2,

f. subjecting the oxime separated in step (d) to the Beckmann rearrangement with the oleum of step (e) to produce a solution of lactam and sulfuric acid,

g. partially neutralizing the sulphuric acid in the solution obtained in step (f) with the ammonium sulfate solution obtained in step (d), wherein the ratio of ammonium sulfate to the sum of ammonium sulfate and sulphuric acid is about 0.45:1 to about 0.63:1, to produce a solution of lactam in ammonium hydrogen sulfate,

h. separating the reaction product of step (g) into lactam product and a solution of ammonium hydrogen sulfate,

i. thermally decomposing the solution of ammonium hydrogen sulfate in step (h) to produce SO_2 in an amount which is substantially the sum of said first amount and said second amount,

j. recycling said first amount of SO_2 to step (a), and

k. recycling said second amount of SO_2 to step (e).

3,852,274

DERIVATIVES OF 1,4-BENZODIAZEPIN-2-ONE AND METHODS FOR PREPARATION THEREOF

Franjo Kajfez; Tomislav Kovac, and Vitomir Sunjic, all of Chiasso, Switzerland, assignors to CRC Compagnie Di Ricerca Chimica S.A., Chiasso, Switzerland

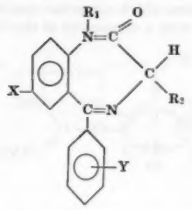
Filed Sept. 14, 1972, Ser. No. 289,143

Claims priority, application Switzerland, Sept. 15, 1971, 13498/71; May 26, 1972, 7856/72

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 D **6 Claims**

1. A compound having the formula



wherein R_1 represents a hydrogen atom or an alkyl group having at most 4 carbon atoms.

R_2 represents an alkoxy group having at most 6 carbons atoms and at least one hydroxyl group or a vicinal isopropylidenedioxy group; or a trihaloacetoxy group;

X represents a hydrogen atom, a halogen atom, a methoxy group, a nitro group or a trifluoromethyl group and

Y represents a hydrogen atom, a halogen atom or a trifluoromethyl group.

3,852,275

PYRAZOLINE OPTICAL BRIGHTENING AGENTS

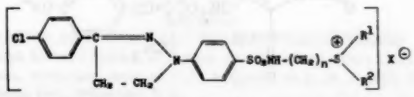
Annick Marthe Suzanne Simone Domergue, Eaubonne; Georges Raymond Henry Mingasson, Paris, and Sureau, Robert Frederic Michel, Enghien les Bains, all of France, assignors to Ugine Kuhlmann, Paris, France

Filed Nov. 24, 1971, Ser. No. 201,993

Int. Cl. CO7d *49/10*

U.S. Cl. 260—239.9 **5 Claims**

1. A compound of the formula:



wherein R^1 and R^2 represent alkyl groups containing one to five carbon atoms, which may be the same or different, *n* is 2 or 3 and X represents an anion selected from the group consisting of halide sulfate, and sulfonate.

3,852,276
5-BENZYL PYRIMIDINES INTERMEDIATE THEREFORE, AND METHOD

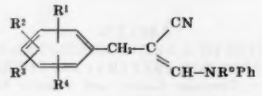
Ronald M. Cresswell, Scarsdale; John W. Mentha, Hartsdale, and Russell L. Seaman, Chappaqua, all of N.Y., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 16,606, March 4, 1970, Pat. No. 3,694,512. This application June 2, 1972, Ser. No. 259,338 Claims priority, application Great Britain, Mar. 6, 1969, 11908/69; Mar. 6, 1969, 11909/69; May 16, 1969, 25171/69; June 13, 1969, 30247/69

Int. Cl. C07c *121/42*

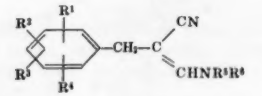
U.S. Cl. 260—240 R **13 Claims**

1. The method of preparing a compound of the formula (I)



(I)

where R^0 is lower alkyl or hydrogen, where R^1 – R^4 are the same or different and each is hydrogen, halogen, lower alkyl, lower alkoxyl or benzyloxy, or R^3 and R^4 taken together may be methylenedioxy when both R^1 and R^2 are hydrogen, where Ph is aryl of 6 to 12 carbons which may be substituted in one, two, or three positions with lower alkyl, lower alhoxyl or halogen and in the above lower akoxyl and lower alkyl contain 1 to 4 carbon atoms which comprises reacting an acid addition salt of HNR^0Ph with a compound of the formula II



(II)

where the free amine of NR^5R^6 has a PKa of about 3 or more units higher than that of the free amine of NR^0Ph, and R^1 — R^4 are as defined above, and NR^5R^6 is an aliphatic, aromatic or cyclic amino group containing not more than 12 carbon atoms.

3,852,277
3-[(α-METHOXY-4-SUBSTITUTED CINNAMOYL)OXYMETHYL]-7-ACYLAMIDOCEPH-3-EM-4-CARBOXYLIC ACIDS

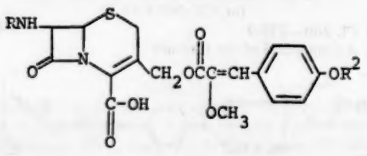
David P. Jacobus, Princeton; William J. Leanza, Berkley Heights, and Burton G. Christensen, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 2, 1972, Ser. No. 277,444

Int. Cl. C07d *99/24*

U.S. Cl. 260—240 J **10 Claims**

1. A compound of the formula



wherein R is an acyl radical and R^2 is hydrogen, sulfo, phosphono, acetyl, pivaloyl, pivaloyloxymethyl or lower alkyl and the non-toxic, pharmaceutically acceptable salts and esters thereof.

3,852,278
PREPARATION OF 4-(2-(FURFURYLIDENEAMINO)-PHENYL)-3-THIOALLOPHANATES

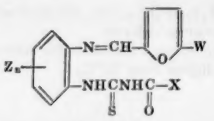
Ronald P. Owen, Warminster, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 22, 1973, Ser. No. 325,783

Int. Cl. C09b *23/00*

U.S. Cl. 260—240 A **10 Claims**

1. A method for preparing a compound of the formula



wherein X is R^1O— or R^1S—

wherein R^1 is

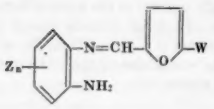
a. alkyl, straight or branched, of 1 to 12 carbon atoms,
b. alkyl of 1 to 12 carbon atoms substituted with halo, or methoxy groups,
c. alkenyl of 2 to 12 carbon atoms,
d. alkynyl of 3 to 12 carbon atoms,
e. phenyl,
f. phenyl substituted with halo, methyl, methoxy or nitro,
g. benzyl or
h. benzyl substituted with halo, methyl, methoxy or nitro;

W is hydrogen, acetoxymethyl, chloro, methyl, or nitro;

Z is halo, methyl, methoxy or nitro and

n is an integer 0 to 3,

which comprises mixing at a temperature in the range of −20° C. to about 35° C. and thereby reacting a compound of the formula



wherein W, Z and n have the above meanings with a compound of the formula

wherein X has the above meanings in an inert solvent containing 0.5 to 20 mole percent of a tertiary amine selected from the group consisting of trimethylamine, triethylamine, tripropylamine, triisobutylamine, methyldiethylamine, tetramethylethylenediamine, N,N-dimethylethanolamine and dimethylaniline.

3,852,279
7-SUBSTITUTED -3,3A,4,5,6,7-HEXAHYDRO-3-SUBSTITUTED-2H-PYRAZOLO (4,3-C)PYRIDINES

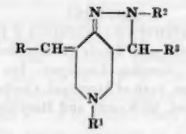
John Krapcho, Somerset, and Chester Frank Turk, Elizabeth, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 12, 1973, Ser. No. 340,408

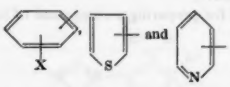
Int. Cl. C09b *23/00, 23/04*

U.S. Cl. 260—240 F **9 Claims**

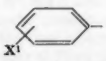
1. A compound of the formula



wherein R and R^3 are selected from the group consisting of



X and X^1 are selected from the group consisting of hydrogen, chloro, fluoro, lower alkyl, lower alkoxy and trifluoromethyl; R^1 and R^2 are selected from the group consisting of hydrogen, lower alkyl,



hydroxy lower alkyl and lower alkanoyl and N-oxides and acid addition salts thereof.

3,852,280

1-BENZYL-4-(ALKYLIDENE)-HEXAHYDRO-4H-AZEPINES

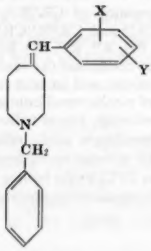
John T. Suh, 3709 W. Scenic Dr., 111 N., Mequon, Wis. 53092, and Richard A. Schnettler, 6234 W. Donges Ln., Brown Deer, Wis. 53223

Filed June 29, 1973, Ser. No. 375,182

Int. Cl. C09b *23/00*; C07d *41/08*

U.S. Cl. 260—240 F **5 Claims**

1. A compound of the formula



in which X and Y are selected from hydrogen, bromo, chloro, fluoro, trifluoromethyl, methylenedioxy, lower alkyl of 1 to 4 carbons, and lower alkoxy of 1 to 4 carbons.

3,852,281

PROCESS FOR THE PREPARATION OF 7-SUBSTITUTED AMINO-DESACETOXYCEPHALOSPORANIC ACID COMPOUNDS

Jan Verweij, Leiden, Netherlands, assignor to Koninklijke Nederlandsche Gis-En Spritus-Fabriek N.V., Delft, Netherlands

Filed Feb. 16, 1971, Ser. No. 115,883

Claims priority, application Great Britain, Feb. 18, 1970, 7892/70; July 23, 1970, 35796/70

Int. Cl. C07d *99/16, 99/24*

U.S. Cl. 260—243 C **18 Claims**

1. In the process for the preparation of 7β-acylamido-3-methyl-ceph-3-em-4-carboxylic acid compounds by heating between 50° and 160° C. the corresponding 6β-acylamidopenicillanic sulfoxide, ester or amide the improvement comprising conducting the heating under anhydrous conditions in the presence of at least 10 moles of a nitrogen containing organic base with a pKa (in water) between 4 and 10 per mole of penicillanic sulfoxide and a silicon-halogen compound of the formula

wherein Y_1, Y_2, and Y_3 are individually selected from the group consisting halogen, alkyl of 1 to 4 carton atoms optionally substituted by halogen, phenyl and phenylalkyl having one to two alkyl carbon atoms and X is halogen.

3,852,282

CERTAIN 2-SUBSTITUTED CEPHALOSPORINS

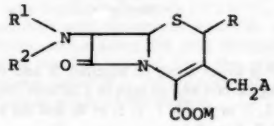
Joseph E. Dolfini, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 812,386, April 1, 1969, abandoned. This application Oct. 16, 1972, Ser. No. 298,172

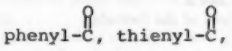
Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **5 Claims**

1. A compound of the formula:



wherein A is selected from the group consisting of hydrogen, acetoxy, hydroxy, and pyridinium and when taken together with M, a monovalent carbon-oxygen bond; M is selected from the group consisting of hydrogen, sodium, potassium, ammonium, calcium, triethylamine, N-ethylpiperidine, dibenzylethylenediamine, benzyl, trimethylsilyl, t-butyl, trichloroethyl, an anionic charge when A is pyridinium, or when taken together with A, a monovalent carbon-oxygen bond; R^1 and R^2 are both hydrogen, or R^2 is hydrogen and R^1 is selected from the group consisting of acetyl,



phenylacetyl, thienylacetyl, phenoxyacetyl, or R^1 and R^2 taken together with the nitrogen atom to which they are attached form phthalimido; and R is selected from the group consisting of iodo, chloro, and bromo.

3,852,283

AMINO ACID DERIVATIVES OF CEPHALOSPORINS

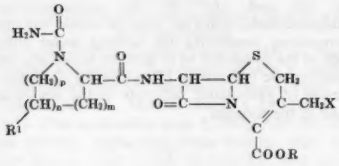
Joseph Edward Dolfini, Princeton, and Raymond Curry Erickson, Metuchen, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 11, 1972, Ser. No. 313,708

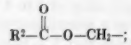
Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **6 Claims**

1. A compound of the formula



wherein R is hydrogen, lower alkyl,



an alkali metal, or an alkaline earth metal; R^1 is hydrogen, hydroxy, or

R^2 is lower alkyl or monocyclic carbocyclic aryl; X is hydrogen, hydroxy, or

wherein R^3 is lower alkyl; or together X and R represent a bond linking carbon and oxygen in a lactone ring; n is 0 or 1; m is 0, 1, 2, 3, or 4; p is 1, 2, 3, or 4; and the sum of $m + n + p$ is 1, 2, 3, 4, or 5.

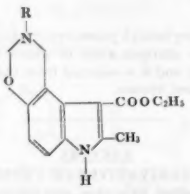
3,852,284

NOVEL SUBSTITUTED OXAZINO(5,6,E)INDOLES

Claude P. Fauran; Michel J. Turin; Guy M. Raynaud, all of Paris, and Claude J. Gouret, Meudon, all of France, assignors to Delalande S.A., Courbevoie, (Hauts de Seine), France

Filed June 6, 1972, Ser. No. 260,298
Claims priority, application France, June 8, 1971, 71.20708
Int. Cl. C07d *87/20*
U.S. Cl. 260—244 R **7 Claims**

1. A compound of the formula:



(I)

in which R is:

alkyl having 2 or 3 carbons, alkyl having 2 or 3 carbons and substituted by one hydroxy or dialkylamino in which the latter alkyl has 1 to 4 carbons, alkenyl having up to 3 carbons, or cycloalkyl having up to 6 carbons.

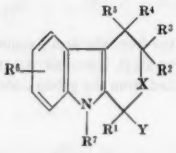
3,852,285

PYRANO- AND THIOPYRANOINDOLE DERIVATIVES

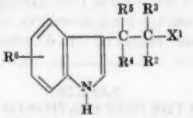
Christopher A. Demerson; Leslie G. Humber, both of Montreal; Andre A. Asselin, Lemoyne; Ivo Jirkovsky, and Thomas A. Dobson, both of Montreal, Quebec, all of Canada, assignors to Ayerst, McKenna and Harrison Limited, Montreal, Canada

Filed Jan. 13, 1972, Ser. No. 217,627
Int. Cl. C07d *87/46*
U.S. Cl. 260—247.1 **1 Claim**

1. A process for preparing a compound of formula

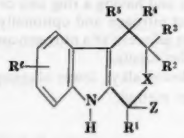


in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo; R^7 is lower alkyl, lower alkenyl, propargyl, phenyl(lower)alkyl or an amino(lower)alkyl radical or formula —Alk—NR^8R^9 wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 and R^9 together with the nitrogen atom to which they are joined from a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, piperazino, 4-(lower alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-1-piperazinyl; X is oxy or thio and Y is an amino(lower)alkyl of formula Alk —NR^8R^9 in which Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are as defined herein, which comprises (a) reacting in the presence of an inert organic solvent and an acid catalyst selected from the class consisting of p-toluenesulfonic acid, aluminum chloride, phosphorus pentoxide, boron trifluoride, zinc chloride, hydrochloric acid, perchloric acid, trifluoroacetic acid and sulfuric acid from 10 minutes to 60 hours at a temperature within the range from 20°C. to the boiling point of the reaction mixture substantially equal molar equivalents of a compound of the formula:

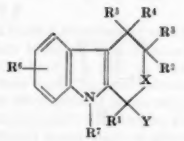


in which R^2, R^3, R^4, R^5 and R^6 are as defined herein and X^1 is hydroxy or mercapto, with the compound of formula

in which R^1 is lower alkyl or lower cycloalkyl and Z is selected from the group consisting of $COOR^{19}$ and Alk^1 - $COOR^{19}$ in which R^{19} is hydrogen or lower alkyl and Alk^1 is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14} and R^{15} are hydrogen or lower alkyl; with the proviso that when R^{19} is hydrogen then Alk^1 is an alkylene selected from the group consisting of $CR^{10}R^{11}CR^{12}R^{13}$ and $CR^{10}R^{11}CR^{12}R_{13}$ $CR^{14}R^{15}$ as defined herein, to provide a tricyclic compound of formula



in which R^1, R^2, R^3, R^4, R^5, R^6, X and Z are as defined herein, (b) subjecting the tricyclic compound to hydrolysis to the corresponding acid in the case where R^{19} is lower alkyl; (c) subjecting the acid product to N-alkylation with an appropriate organic halide to introduce the R^7 substituent; (d) subjecting the latter compound to amidation with an appropriate amine of formula NHR^8R^9 in which R^8 and R^9 are as defined herein to give the corresponding amide, reducing the amide with a suitable complex metal hydride to give the corresponding compound of formula



in which R^1, R^2, R^3, R^4, R^5, R^6 and X are as defined herein, R^7 and y are as defined herein and, if desired, forming the acid addition salt thereof with a pharmaceutically acceptable acid.

3,852,286

DIHYDROINDANE CARBOXYLIC AND CYCLOHEXADIENE ACETIC ACIDS, ESTERS AND SALTS

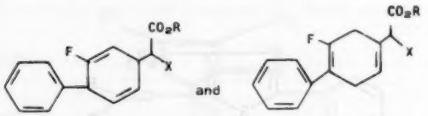
Charles M. Hall, and William J. Wechter, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 16, 1973, Ser. No. 333,395

Int. Cl. C07c *63/50, 69/76*

U.S. Cl. 260—247.2 R **5 Claims**

1. A compound selected from the group consisting of



wherein R is selected from the group consisting of hydrogen, alkyl of from one to three carbon atoms, inclusive, and a pharmaceutically acceptable metal or amine cation;

X is selected from the group consisting of $—CH_3$, and $—CH_2CH_2—$ with the proviso that $—CH_3$ is attached to the two carbon atom of the cyclohexadiene, thereby forming an indane type compound.

3,852,287

PREPARATION OF THIONAMIDES

Mikhail M. Girgis, Guelph, Ontario, Canada, assignor to Uniroyal, Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 23,063, March 26, 1970, Pat. No. 3,700,664. This application Sept. 7, 1972, Ser. No. 287,173The portion of the term of this patent subsequent to Oct. 24, 1989, has been disclaimed.

Int. Cl. C07d *87/46*

U.S. Cl. 260—247.1 T **8 Claims**

1. In a method of preparing a benzo, o-tolu, m-tolu, nicotino, picolino, N-morpholino, or phenylacetothionamide, which comprises reacting a benzo, o-tolu, m-tolu, nicotino, picolino, N-morpholino, or phenylacetonitrile with a substantially equimolar amount of hydrogen sulfide in a closed reactor at elevated temperature in the presence of a basic catalyst, the improvement which comprises conducting the reaction in the presence of a mole ratio of catalyst to nitrile in the range of 1:6.5 to 1:15.

3,852,288

PROCESS FOR COLOR STABLE ALKYL AND ALKENYL ACID PHOSPHATE COMPOSITIONS

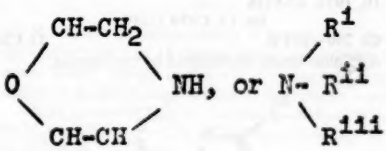
Arthur A. Baum, Wilmington, Del., and Leonard A. Rothman, Brooklyn, N.Y., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 67,581, Aug. 27, 1970, abandoned. This application Oct. 11, 1972, Ser. No. 296,566

Int. Cl. C07d *87/32*

U.S. Cl. 260—247.7 D **2 Claims**

1. In a process for preparing alkyl and alkenyl acid phosphates, and salts thereof, by reacting a C_4 to C_{18} alcohol, or mixture of alcohols, with phosphorus pentoxide, to form the acid phosphates, and reacting the acid phosphate formed thereby with a member selected from the group of salt-forming reactants consisting of sodium potassium and lithium hydroxides, and an amine of the formula

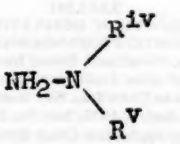


wherein

R^i, R^{ii} and R^{iii} are selected from —H, $—CH_3$, $—C_2H_4OH$ or $—C_3H_6OH$ with no more than 2 of R^i, R^{ii}, and R^{iii} being —H or CH_3,

to form the corresponding salt of the acid phosphate, the improvement which comprises

reacting the acid phosphate reactants with a hydrazine of the formula



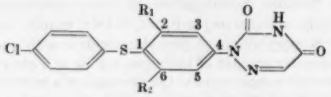
wherein each of R^{iv} and R^v is independently H or an alkyl group having from 1 to 4 carbon atoms.

3,852,289
SULFENYLATION OF N-ARYLHETEROCYCLIC COMPOUNDS

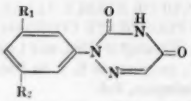
Banavara L. Mylari, Waterford, and Thomas M. Brennan, Niantic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 20, 1973, Ser. No. 342,969
Int. Cl. C07d *55/10*
U.S. Cl. 260—248 AS **3 Claims**

1. A process for the preparation of compound of the formula:



wherein R_1 is selected from the group consisting of methyl and hydrogen; and R_2 is selected from the group consisting of methyl and chloro, which comprises contacting p-chlorosulfenyl chloride with a compound of the formula:



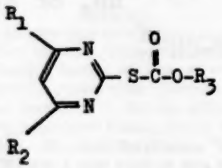
in the presence of a reaction-inert solvent at a temperature of 25-110° C.

3,852,290
THIOCARBONATES

Takeshi Nagasawa; Katumasa Kuroiwa, and Kouichi Narita, all of Koriyama, Japan, assignors to Nitto Boseki Co. Ltd., Fukushima-shi, Japan

Filed Sept. 8, 1972, Ser. No. 287,410
Claims priority, application Japan, Sept. 17, 1971, 46-72261; Sept. 27, 1971, 46-75306; Sept. 30, 1971, 46-76555; Jan. 10, 1972, 47-5116
Int. Cl. C07d *51/36*
U.S. Cl. 260—251 R **11 Claims**

1. A thiolcarbonate represented by the formula,



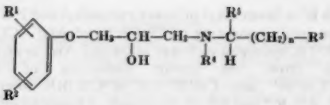
wherein R_1 and R_2 are individually a hydrogen atom or a methyl group, and R_3 is a straight chain or branched chain alkyl group having 1 to 5 carbon atoms, a straight chain or branched chain alkenyl group having 2–5 carbon atoms, or a benzyl or benzhydryl group which may be nuclear substituted.

3,852,291
HETEROCYCLIC DERIVATIVES OF PHENOXYPROPANOLAMINES

Joachim Augstein, Woodhouse Eaves; David Alexander Cox, Canterbury, and Allan Leslie Ham, Broadstairs, all of England, assignors to Pfizer Inc., New York, N.Y.

Filed Aug. 2, 1972, Ser. No. 277,159
Claims priority, application Great Britain, Aug. 4, 1971, 36606/71
Int. Cl. C07d *51/28*
U.S. Cl. 260—256.4 C **20 Claims**

1. A compound having the formula:



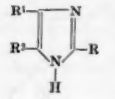
where R^1 is hydrogen or a lower alkanoyl amino;
R^2 is hydrogen or methyl;
R^3 is an at least partially hydrogenated imidazoline or pyrimidine linked to the remainder of the molecule by one of its nitrogens and having a ring oxo or thio substitutent adjacent to that nitrogen and optionally a second oxo or thio substituent adjacent to a nitrogen and/or one or more lower alkyl substituents;
R^4 is hydrogen, lower alkyl, lower alkanoyl or benzyl;
R^5 is hydrogen or methyl;
and n is 1 to 3;

3,852,292
2-(PYRIDYL)-IMIDAZOLE-4,5-DICARBOXYLIC ACID AND DERIVATIVES

John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 250,505, May 5, 1972, Pat. No. 3,812,136.
This application July 30, 1973, Ser. No. 383,851
Int. Cl. C07d *31/34*
U.S. Cl. 260—295 R **4 Claims**

1. A compound of the formula:



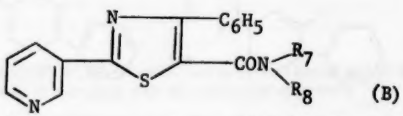
wherein R is pyridyl and R^1 and R^2 are the same or different and represent carboxy, lower alkoxycarbonyl, and the non-toxic, pharmacologically acceptable acid addition salts thereof.

3,852,293
4-PHENYL-2-(3-PYRIDYL)-THIAZOLE CARBOXAMIDES

Zaven S. Ariyan, Woodbury, Conn., and William A. Harrison, Guelph, Ontario, Canada, assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Montreal, Quebec, Canada

Filed June 21, 1972, Ser. No. 264,817
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 D **4 Claims**

1. A compound of the formula:



(B)

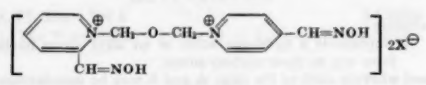
wherein R_7 is hydrogen or an alkyl group of up to three carbon atoms and R_8 is an alkyl group of up to three carbon atoms; and pharmaceutically acceptable acid addition salts thereof.

3,852,294
BIS-QUATERNARY PYRIDINIUM SALTS

Ilse Hagedorn, Freiburg, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Continuation-in-part of Ser. No. 755,752, Aug. 27, 1968, Pat. No. 3,773,775. This application Dec. 20, 1972, Ser. No. 316,929
Int. Cl. C07d *31/40*
U.S. Cl. 260—296 M 2 Claims

1. A pharmaceutically acceptable quaternary salt of the formula



wherein

X is an equivalent of a mono- or polyvalent anion.

3,852,295
SALTS OF MONO-O-SUBSTITUTED AND O,O-DIARYL SUBSTITUTED PHOSPHORIC ACIDS AND A NITROGEN BASE

William Graham, Pinner, and Lewis Aubrey Wetherill, North Wembley, both of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

Division of Ser. No. 18,284, March 10, 1970, Pat. No. 3,725,397. This application Jan. 12, 1973, Ser. No. 323,213
Int. Cl. C07d *31/28*
U.S. Cl. 260—297 P 8 Claims

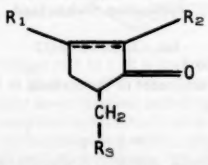
1. A salt fromed from a monoamine which is an unsaturated heterocyclic tertiary nitrogen base selected from pyridine or lower alkyl pyridine having a pKb as measured in water at 25°C of not less than 4 and an acid selected from the group consisting of lower alkyl, phenyl lower alkyl and phenyl dihydrogen phosphates and such dihydrogen phosphates wherein the lower alkyl, phenyl lower alkyl or phenyl group is substituted by at least one of a halogen atom or a nitro group; 2-chloromethyl-4-nitrophenyl dihydrogen phosphate; and diphenyl hydrogen phosphates and such hydrogen phosphates in which at least one of the phenyl groups is substituted by at least one of a halogen atom or a nitro group.

3,852,296
MANNICH BASES OF CYCLOPENTANONES AND CYCLOPENT-2-ENONES AND PROCESS OF PREPARING THE SAME

Rene Viterbo, Paris, France; Michele Mastursi, and Giulio Cesare Perri, both of Naples, Italy, assignors to Richardson-Merrell S.p.A., Naples, Italy

Continuation-in-part of Ser. No. 163,487, July 16, 1971, abandoned. This application June 5, 1972, Ser. No. 259,972
Int. Cl. C07d *87/34*
U.S. Cl. 260—247.7 K 10 Claims

1. A compound having the formula



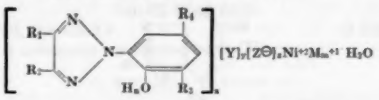
where R_1 and R_2 are each separately alkyl of 1 to 8 carbon atoms, phenyl, halophenyl, benzyl, carboethoxymethyl diethylacetamide and acetomorpholide, R_3 is mono(lower)alkylamino, di(lower)alkylamino, anilino, pyrrolidino, morpholino, piperidino, and (lower)alkylpiperazino wherein the alkyl portion of the (lower)alkyl radicals have 1 to 4 carbon atoms.

3,852,297
NICKEL COMPLEXES OF 2-(2-HYDROXYPHENYL)-Y-TRIAZOLES

Paul Moser, Riehen, and Jean Rody, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 30, 1972, Ser. No. 302,336
Claims priority, application Switzerland, Nov. 10, 1971, 16322/71
Int. Cl. C07d *55/02*
U.S. Cl. 260—299 14 Claims

1. Compounds of the formula



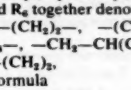
(I)

in which R_1 denotes an alkyl group with 1 to 18 carbon atoms, the phenyl group, or a methylphenyl, dimethylphenyl, chlorophenyl or alkoxyphenyl group, the latter with 7 to 14 carbon atoms, R_2 denotes hydrogen or, if R_1 denotes an alkyl group with 2 to 18 carbon atoms, also denotes an alkyl group which is one carbon atom lower than R_1, and in the case that R_1 denotes the phenyl group or a substituted phenyl group, also denotes an alkyl group with 1 to 16 carbon atoms, the phenyl group or a methylphenyl, dimethylphenyl, chlorophenyl or alkoxyphenyl group, the latter with 7 to 14 carbon atoms, or R_1 and R_2 together denote unsubstituted or lower alkyl-substituted tetramethylene, R_3 and Rk_4 independently of one another denote hydrogen, an alkyl group with 1 to 18 carbon atoms, an aralkyl group with 7 to 9 carbon atoms, a cycloalkyl group with 6 to 8 carbon atoms or the α-methylcyclohexyl group, with R_3 and R_4 together containing at most 22 carbon atoms, Y denotes a nitrogen-containing organic base of the following group

a. amines of the formula

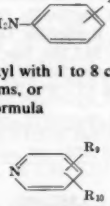
wherein R_5, R_6 and R_7 independently of one another denote hydrogen, alkyl with 1 to 18 carbon atoms, alkenyl with 3 to 18 carbon atoms, benzyl, cyclohexyl, 2-hydroxyethyl or 2-aminoethyl, or R_5 and R_6 together denote the radicals $-(CH_2)_5-$, $-(CH_2)_2-O-(CH_2)_2-$, $-(CH_2)_2-NH-(CH_2)_2-$, $-CH(CH_3)-(CH_2)_4-$, $-CH_2-CH(CH_3)-(CH_2)_3-$ or $-(CH_2)_2-CH(CH_3)-(CH_2)_2$,

b. anilines of the formula



wherein R_8 denotes alkyl with 1 to 8 carbon atoms or alkoxy with 1 to 8 carbon atoms, or

c. pyridines of the formula



wherein R_9 and R_{10} independently of one another denote hydrogen or methyl or R_9 and R_{10} together denote a benzo ring, Z^- denotes the anion of an alkanecarboxylic acid with 2 to 18 carbon atoms, an alkenylcarboxylic acid with 3 to 18 carbon atoms, a thia- or oxa-alkanecarboxylic acid with 3 to 15 carbon atoms, benzoic acid, an alkylbenzoic acid with 8 to 11 carbon atoms or a naphthoic acid, or denotes the hydroxyl ion, the chloride ion or the bromide ion, M^{+1} denotes a monovalent alkali metal ion and n denotes 0 or 1, m denotes 0, 1 or 2, x denotes 1 or 2, y denotes 0 or 1, w denotes all values between 0 and 2 and z denotes $(2 + m) - x(1 - n)$.

3,852,298
CERTAIN POLYSUBSTITUTED BENZOTHIAZOLES

Klaus Wagner, Cologne; Hans Scheinpflug, and Paul-Ernst Frohberger, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

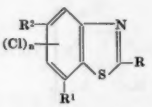
Filed July 10, 1972, Ser. No. 270,391

Claims priority, application Germany, July 23, 1971, 2136923

Int. Cl. C07d *91/44*

U.S. Cl. 260—304 **7 Claims**

1. A substituted benzthiazole of the formula



in which

R is CN or a radical of the formula

—CO—Z—,

R^1 is halogen, nitro, trifluoromethyl, trifluoromethoxy or a radical of the formula

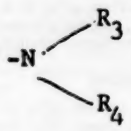
$—SO_2—Y$,

R^2 is hydrogen, halogen, trifluoromethyl, trifluoromethoxy, nitro, methyl, ethyl, CN or a radical of the formula

—CO—Z,

n is 0, 1 or 2, and

Y and Z each independently is hydrogen, alkyl, cycloalkyl or alkoxy with up to 6 carbon atoms, benzyl or phenyl, or a radical of the formula



in which

R^3 and R^4 each independently is hydrogen, alkyl or alkoxyalkyl with up to 12 carbon atoms, or phenylalkyl or phenyl wherein the phenyl may be substituted by chlorine, bromine, trifluoromethyl or methyl, or R^3 and R^4, together with the attached nitrogen atom, form a pyrrolidine, piperidine or morpholine ring.

3,852,299
3,4-BIS(CARBETHOXY)-2-ISOXAZOLINE AND PROCESS

William M. Hutchinson, Bartlesville, Okla., assignor to Philips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 507,700, Nov. 15, 1965, Pat. No. 3,591,621. This application Jan. 25, 1971, Ser. No. 109,582

Int. Cl. C07d *85/16*

U.S. Cl. 260—307 F **2 Claims**

1. 3,4-Bis-(carbethoxy)-2-isoxazoline.

3,852,300
CERTAIN 6-PHENYL-4H-S-TRIAZOLO[1,5-a][1,4-BENZODIAZEPINES]

Andre Gagneux, Basel; Roland Heckendorn, Arlesheim, Basel-Land, and Rene Meier, Buus, Basel-Land, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

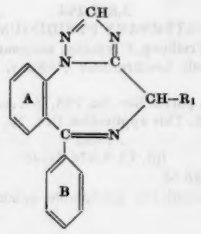
Filed Dec. 8, 1971, Ser. No. 206,176

Claims priority, application Switzerland, Dec. 11, 1970, 18385/70; Aug. 4, 1971, 5232/70

Int. Cl. C07d *57/02*

U.S. Cl. 260—308 R **6 Claims**

1. A compound of the formula *Ia*



wherein

R_1 represents a hydrogen atom or an alkyl group having from one to three carbon atoms,

and wherein each of the rings A and B may be unsubstituted or substituted by one chlorine, fluorine or bromine atom, nitro group, trifluoromethyl group, alkyl group having from one to six carbon atom or alkoxy group having from one to six carbon atoms, and the 5-oxide and the pharmaceutically acceptable acid addition salts thereof.

3,852,301
ENOL BETAINES OF IMIDAZOLES

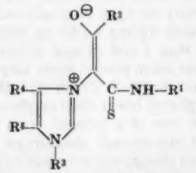
Rudiger D. Haugwitz, Titusville, and Venkatachala L. Narayanan, Hightstown, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed June 21, 1973, Ser. No. 372,356

Int. Cl. C07d

U.S. Cl. 260—309 **5 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, allyl, benzyl, cyclohexyl, phenyl and phenyl substituted by fluoro, chloro, lower alkyl or lower alkoxy: R^2 is selected from the group consisting of phenyl and phenyl substituted by chloro, lower alkyl, lower alkoxy, phenyl, bromo, fluoro or nitro; R^3 is selected from the group consisting of lower alkyl and benzyl; and R^4 and R^5 are both hydrogen.

3,852,302
DIACRYLIC ACID ESTER DERIVATIVES OF HYDANTOIN COMPOUNDS

Juergen Habermeier, Pfeffingen, Basel-Land, and Daniel Porret, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

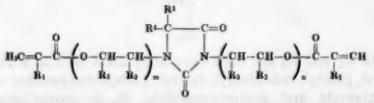
Filed Apr. 5, 1972, Ser. No. 241,386

Claims priority, application Switzerland, Apr. 16, 1971, 5557/71

Int. Cl. C07d *49/32*

U.S. Cl. 260—309.5 **6 Claims**

1. A diacrylic acid ester of the formula



wherein R_1 and R_3 are independently hydrogen or methyl, R_2 is hydrogen, lower alkyl or lower alkyl interrupted by oxygen,

R^4 and R^5 are independently hydrogen or alkyl of one to four carbons, *m* and *n* are each a whole number having a value of 1 to 30.

3,852,303

PROCESS FOR IMIDAZO[2,1-a]ISOINDOLES AND INTERMEDIATES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc.

Division of Ser. No. 812,948, March 5, 1969, abandoned. This application Nov. 30, 1972, Ser. No. 310,821

Int. Cl. C07d *49/34*

U.S. Cl. 260—309.6 **3 Claims**

1. The N,o-dilithium derivative of 2-phenyl-2-imidazoline.

3,852,304

FLUOROALKYLPH ENYLCYCLOAMIDINES AND THEIR PRODUCTION

Hartmund Wollweber, Wuppertal-Elberfeld; Edgar Enders, Cologne, and Wilhelm Stendel, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

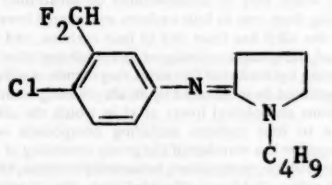
Filed Feb. 22, 1971, Ser. No. 117,709

Claims priority, application Germany, Feb. 26, 1970, 2009019

Int. Cl. C07d *27/04*

U.S. Cl. 260—326.85 **14 Claims**

1. The compound which is



3,852,305

ISOMERIZATION OF ALKENYL-ALKOXYBENZENES

Tsuneyuki Nagase; Gohu Suzukamo, and Masami Fukao, all of Takatsuki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka-fu, Japan

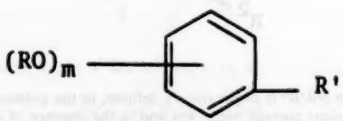
Filed Nov. 16, 1971, Ser. No. 199,174

Claims priority, application Japan, Nov. 26, 1970, 45-104647; June 23, 1971, 46-045861

Int. Cl. C07d *13/00*

U.S. Cl. 260—340.9 **14 Claims**

1. A method for isomerization of alkenyl-alkoxybenzenes which comprises contacting an alkenyl-alkoxybenzene of the formula:



wherein *m* is an integer of 1 to 5, R is lower alkyl or, when *m* is 2 or more and at least two of R are adjacent, the adjacent two R may represent lower alkylene including methylene and R′ is an alkenyl group having a double bond at the position not conjugated with the benzene ring, with a catalyst to give the corresponding alkenyl-alkoxybenzene wherein the double bond in the alkenyl group represented by R′ is migrated to the position conjugated with the benzene ring, the said catalyst being prepared by heating alumina, from 0.01 to 100% by weight of the alumina of an alkali metal hydroxide, and from 0.01 to an equimolar amount with respect to the alkali metal hydroxide of an alkali metal at a temperature higher than the melting point of the alkali metal to give a catalyst composition which is colored white to gray and which does not show any X-ray diffraction pattern for alkali metal as a simple substance therein.

3,852,306

CARBOXYMETHYL DIOXOLANE POLYCARBOXYLATES

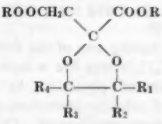
John N. Rapko, and Russel D. Harken, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 8, 1972, Ser. No. 251,161

Int. Cl. C04d *13/04*

U.S. Cl. 260—340.9 **3 Claims**

1. A compound represented by the formula



wherein R_1 is selected from the group consisting of —COOR and $—CH_2COOR$; R_2, R_3 and R_4 are selected from the group consisting of —COOR, $—CH_2COOR$, hydrogen and methyl; and R is selected from the group consisting of methyl, ethyl, propyl, butyl, hydrogen, alkali metal and ammonium.

3,852,307

SYNTHESIS OF ZEARALANONE AND RELATED COMPOUNDS

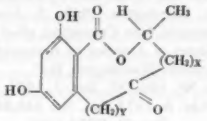
Wilbert Herbert Urry, Chicago, Ill., and Guy Towns Mullenbach, Berkeley, Calif., assignors to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Apr. 25, 1972, Ser. No. 247,343

Int. Cl. C07d *9/00, 7/20*

U.S. Cl. 260—343.2 F **3 Claims**

1. A compound of the formula



wherein X is an integer having the value of from 0 to 6 and Y is an integer having the value of from 3 to 8, with the proviso that when X is 3, Y is not 5.

3,852,308

PROCESS FOR THE PRODUCTION OF PHTHALIC ANHYDRIDE

Robert C. Ryder, Bethel Park; Robert E. Ryan, and William J. Klapproth, Jr., both of Pittsburgh, all of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 81,334, Oct. 16, 1970, abandoned. This application Jan. 26, 1973, Ser. No. 326,777

Int. Cl. C07c *63/18*

U.S. Cl. 260—346.4 **5 Claims**

1. In a process for the production of phthalic anhydride by the oxidation of naphthalene in vapor form wherein a mixture of air and naphthalene vapors flows upwardly at an elevated temperature through a dense fluid bed of oxidation catalyst at a vertical velocity to maintain the catalyst in a fluidized condition, said catalyst being comprised of about **3** to **10** percent by weight of vanadium pentoxide and about 15 to 35 percent by weight of potassium sulfate supported on about 55 to 75 percent by weight of silica gel, the improvement comprising:

a. maintaining the reaction zone at a superatmosphere pressure of at least 25 pounds per square inch gauge;

b. maintaining the air to naphthalene weight ratio within the range of 6.0 : 1 to 8.5 : 1;

c. maintaining the naphthalene loading within the range of 0.08 to 0.50 pounds of naphthalene per hour per pound of fluidized catalyst; and

d. maintaining the reaction temperature within the range of from 320° to 400° C.

whereby a naphthalene to catalyst contact ratio of at least 4.0 × 10^{-4} pounds of naphthalene per pound of catalyst is maintained.

3,852,309

ORGANIC SOLVENT SOLUBLE METAL ALUMINATES

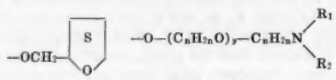
Todd S. Simmons, Montclair; Rudolph H. Trinks, Union, and Jaroslav Vit, Belle Meade, all of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Filed Nov. 24, 1970, Ser. No. 92,526

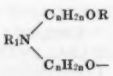
Int. Cl. C07d *5/16;* **C07f** *5/06*

U.S. Cl. 260—347.7 **26 Claims**

1. A compound having one of the formulae (1) $Me_3Al\ Z_6$ and (2) $M'\ [Al(Z_4)]_2$ where Me is selected from the group consisting of sodium and potassium, M′ is selected from the group consisting of calcium, strontium and barium, Z is selected from the group consisting of $—O(C_nH_{2n}O)_xR$,



and



where R is selected from the group consisting of lower alkyl and tetrahydrofurfuryl, R_1 and R_2 are lower alkyl, *n* is an integer from 2 to 4, *x* is an integer from 1 to 4 and *y* is an integer from 0 to 4.

3,852,310

ARTHROPOD MATURATION INHIBITORS

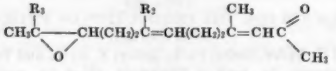
Meyer Schwarz, Kensington; Philip E. Sonnet, Bowie, and Nobel Wakabayashi, New Carrollton, all of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 104,781, Jan. 7, 1971. This application Apr. 6, 1973, Ser. No. 348,841

Int. Cl. C07d *1/00*

U.S. Cl. 260—348 R **2 Claims**

1. A compound of the formula



in which R_2 and R_3 are methyl.

3,852,311

ERGOSTERYL ESTERS HAVING LIQUID CRYSTALLINE PROPERTIES

Harold J. Nicholas, 12456 Merrick Dr., Creve Coeur, Mo. 63141, and Furn F. Knapp, Jr., 6700 Torlina Dr., Berkeley, Mo. 63134

Continuation of Ser. No. 36,449, May 11, 1970,. This application July 3, 1972, Ser. No. 268,572

Int. Cl. C07c *169/54*

U.S. Cl. 260—397.2 **3 Claims**

1. A method of preparing smectic liquid crystals of sterols selected from the group consisting of ergosterols and 24-methyl cholestanol comprising the steps of

a. forming fatty acid esters of said sterols, said fatty acids having a chain length of C_2–C_{30} and being selected from the group consisting of straight chain, branched chain, saturated, and unsaturated compounds,

b. purifying said fatty acid esters,

c. directing the temperature of the fatty acid esters toward the isotropic temperature, and

d. forming liquid crystal structure in the smectic mesophase in said fatty acid esters,

steps (a) and (b) being performed in the dark to minimize degradation due to irradiation.

3,852,312

PREPARATION OF MANNICH BASES

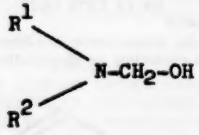
Imre Bacso, Morristown, and George A. Cooke, Denville, both of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 162,000, July 12, 1971,. This application Jan. 15, 1973, Ser. No. 323,410

Int. Cl. C07c *169/08, 169/20*

U.S. Cl. 260—397.4 **26 Claims**

1. A process for the preparation of a steroid having a carbon skeleton selected from the group consisting of androstane, and 19-nor-androstane, having both a β-hydroxy group and an α-omega-amino-1-propynyl group in the 17-position; wherein the steroid moiety has from 18 to 23 carbon atoms exclusive of ester radicals and of any omega-amino-1-propynyl group; and wherein the omega-amino group is of the formula NR^1R^2 wherein R^1 is a member of the group consisting of, alkyl having from one to four carbons, cycloalkyl of five to six ring members which may be unsubstituted or substituted by an alkyl having from one to four carbons and phenyl lower alkyl in which the alkyl has from one to four carbons, and R^2 is a member of the group consisting of, alkyl having from one to four carbons, cycloalkyl of five to six ring members which may be unsubstituted or substituted by an alkyl having from one to four carbons and phenyl lower alkyl in which the alkyl has from one to four carbons including compounds wherein NR^1R^2 together is a member of the group consisting of unsubstituted piperidino, pyrrolidino, hexamethylenimino, morpholino, piperazino, and lower-alkylated piperidino, pyrrolidino, hexamethylenimino, morpholino and piperazino substituted with from one to three alkyl groups containing from one to four carbons, which comprises reacting a corresponding steroidal compound bearing at the 17-position both a β-hydroxy group and an α-ethynyl group, with a compound of the formula



wherein NR^1R^2 is as previously defined, in the presence of a monovalent coinage metal ion and in the absence of an acid catalyst at a temperature of from 20° to 80°C.

3,852,313

NOVEL FLUOROCARBON ACIDS

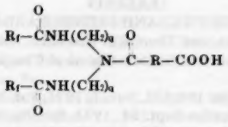
Wilhelmus M. Beyleveld, Whippany; Bryce C. Oxenrider, Florham Park, and Cyril Woolf, Morristown, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 867,371, Oct. 17, 1969, Pat. No. 3,754,026. This application May 21, 1973, Ser. No. 362,616

Int. Cl. C07c *103/32*

U.S. Cl. 260—404.5 **5 Claims**

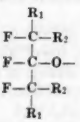
1. Compounds having the formula



wherein R is an alkyl diradical of one to 12 carbon atoms an alkylene diradical of two to 12 carbon atoms, or a phenyl diradical; q is an integer from 1 to 6; and R_f is a radical having the formula

$$Y(CF_2)_s(CH_2)_t$$

wherein s is an integer from 1 to 16, t is an integer not greater than s from 0 to 8, with the sum of s plus t being from 1 to 20; and Y is selected from the group consisting of F_3C— and radicals having the formula



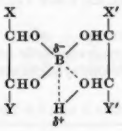
wherein R_1 and R_2 are fluorine or perfluoroalkyl groups each having from one to nine carbon atoms, provided that not more than three of the R_1 and R_2 groups are perfluoroalkyl groups.

3,852,314
SURFACE-ACTIVE ORGANOBORON COMPOUNDS

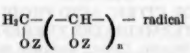
Hiroyoshi Hamanaka, Tokyo; Yasuhisa Okazaki, Ichikawa, and Hiroshi Yoshijima, Chiba, all of Japan, assignors to Toho Chemical Industry Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1971, Ser. No. 203,464
Claims priority, application Japan, Dec. 3, 1970, 45-106282
Int. Cl. C07d *107/02;* **C08k** *1/60;* **B01f** *17/34*
U.S. Cl. 260—410.7 **17 Claims**

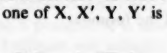
1. Surface-active organoboron compounds having the following structural formula:



wherein X, X′, Y, Y′ are H, CH_3, C_2H_5 or



in which n is 0 1, 2 or 3, Z is H or H—$(OCH_2CH_2—)_j$— or RCO—$(OHC_2CH_2—)_k$— radical wherein R is an alkyl group with 7 to 31 carbon atoms and the total of k+j is in a range of 1–40 and at least one of X, X′, Y, Y′ is

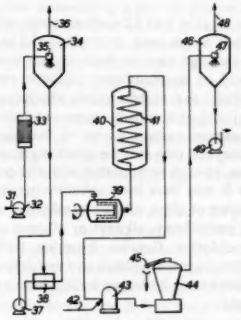


which group contains at least one — radical, where Z is RCO—$(OCH_2CH_2—)_k$—.

3,852,315
PROCESS OF INTERESTERIFICATION OF GLYCERIDE OILS

Willem Herman DeGroot, Vlaardingen, and Martin Hugh Hilder, Rotterdam, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 94,997, Dec. 3, 1970, abandoned, which is a division of Ser. No. 744,418, July 12, 1968, abandoned. This application Oct. 16, 1972, Ser. No. 298,075
Claims priority, application Luxembourg, July 14, 1967, 54108
Int. Cl. C11c *3/10*
U.S. Cl. 260—410.7 **8 Claims**



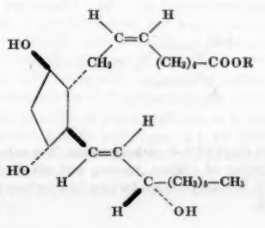
1. An interesterification process in which a mixture to be interesterified and consisting essentially of a glyceride oil is maintained below its boiling point at a temperature of from about 100° to about 275°C. and an alkali metal having a melting point substantially below the temperature of the interesterified mixture is extruded directly to melt therein, maintaining the alkali metal in solid form at least in the immediate vicinity of its point of entry into the interesterification mixture to provide a seal of solid alkali metal between its supply and the interesterification mixture, distributing the molten alkali metal throughout the interesterification mixture and separating undesired soap from the interesterified product.

3,852,316
PROSTAGLANDIN F2 β ANALOGS

Philip E. Beal, III, Kalamazoo; Gunther S. Fonken, Charleston Township, Kalamazoo County, and John E. Pike, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 17,874, March 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 606,019, Dec. 30, 1966, abandoned, which is a continuation-n-part of Ser. No. 345,852, Feb. 19, 1964, Pat. No. 3,296,091. This application July 19, 1972, Ser. No. 273,316
Int. Cl. C07c *61/32, 69/74*
U.S. Cl. 260—413 **2 Claims**

1. A compound of the formula:



wherein R is hydrogen, alkyl of one to 8 carbon atoms, or a pharmacologically acceptable cation.

3,852,317

PRODUCTION OF ISOCYANATES

Fritz Zanker, Worms, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigskafen/Rhine, Germany

Filed Oct. 25, 1972, Ser. No. 300,738
Int. Cl. C07c *119/04*
U.S. Cl. 260—453 P **12 Claims**

1. A process for the production of an isocyanate of the formula:

$$R—N=C=O \qquad (I)$$

in which R is alkyl of 1 to 12 carbon atoms, alkenyl or alkynyl of 2 to 6 carbon atoms each, cycloalkyl of 5 to 8 carbon atoms onto which through two or three common carbon atoms a five-membered or six-membered alicyclic ring may be condensed, alkyl of 1 to 6 carbon atoms which may be substituted by cycloalkyl of 5 or 6 carbon atoms onto which through two or three common carbon atoms a five-membered or six-membered alicyclic ring may be condensed, aralkyl of 7 to 12 carbon atoms, phenyl or naphthyl with the proviso that all of said radicals R may bear inert substituents selected from the group consisting of alkyl, alkoxy or alkylthio of 1 to 5 carbon atoms each, carbalkoxy, alkenyl or alkynyl of 2 to 5 carbon atoms each, chlorine, fluorine, bromine, trifluoromethyl, nitrile, phenylthio, cyclohexylthio or benzylthio, which process comprises eliminating hydrogen halide from a carbamyl halide of the formula:

$$R—NH—\overset{O}{\overset{\|}{C}}—X \qquad (II)$$

in which R has the meanings given above and X is bromine or chlorine, by contact with a liquid aqueous acidic reaction medium consisting essentially of water and an acid selected from the group consisting of hydrogen chloride and hydrogen bromide at a temperature of from −30° to +30°C., the acid concentration increasing over the course of the reaction but being controlled such that it does not exceed about 30% by weight of hydrogen halide based on the total weight of water.

3,852,318

SUBSTITUTED BENZYL-THIOLCARBAMIC ACID ESTERS

Akio Kudamatsu; Masao Miyamoto, and Nobuo Fukazawa, all of Tokyo, Japan, assignors to Bayer-Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 875,546, Nov. 10, 1969, abandoned. This application Aug. 10, 1971, Ser. No. 170,655
Claims priority, application Japan, Nov. 12, 1968, 43-82249
Int. Cl. C07c *155/02*
U.S. Cl. 260—455 A **18 Claims**

1. A substituted benzyl-thiolcarbamic acid ester of the formula

in which R is alkyl of 1–4 carbon atoms, X is selected from the group consisting of chloro, bromo and alkyl of 1–4 carbon atoms, and Y is dialkylamino having 1–4 carbon atoms in each alkyl moiety.

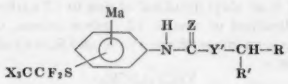
3,852,319

SUBSTITUTED THIO-AND DITHIO-CARBANILATES

Fred Y. Edamura, and Thomas J. Giacobbe, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 194,532, Nov. 1, 1971, Pat. No. 3,790,619. This application Sept. 24, 1973, Ser. No. 400,474
Int. Cl. C07c *155/02, 155/08*
U.S. Cl. 260—455 A **2 Claims**

1. Substituted thio- and dithio- carbanilate compounds corresponding to the formula:



wherein:

each X independently represents hydrogen, bromo, chloro, or fluoro, with the proviso that at least one X is always bromo, chloro or fluoro;

Y, Y′ and Z each independently represent oxygen or sulfur;

each M independently represents bromo, chloro, fluoro, iodo, nitro or lower alkyl of from one to about four carbon atoms;

a represents an integer of from 0 to 3, both inclusive;

R represents hydrogen, lower alkyl of from one to five carbon atoms, lower alkenyl of from two to four carbon atoms, or lower alkynyl of from two to four carbon atoms; and

R′ is hydrogen or methyl.

3,852,320

ALLYL 2,2-DINITROPROPYL CARBONATE

Albert L. Rocklin, Walnut Creek, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Oct. 12, 1970, Ser. No. 81,638
Int. Cl. C07c *69/00*
U.S. Cl. 260—463 **8 Claims**

1. Allyl 2,2-dinitropropyl carbonate.

3,852,321

3,3-DIMETHYLCYCLOHEXYLIDENEACETONITRILES

James H. Babler, 125 Callan, Evanston, Ill. 60602

Filed Oct. 13, 1972, Ser. No. 297,421
Int. Cl. C07c *121/48*
U.S. Cl. 260—464 **2 Claims**

1. The mixture of Z and E-3,3-dimethylcyclohexylideneacetonitrile containing 28 to 65 percent Z-3,3-dimethylcyclohexylideneacetonitrile.

3,852,322

PROCESS FOR CITRIC ACID PRODUCTION AND INTERMEDIATES THEREFOR

Hermann Faubl, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed June 15, 1973, Ser. No. 370,337
Int. Cl. C07c *121/48*
U.S. Cl. 260—464 **1 Claim**

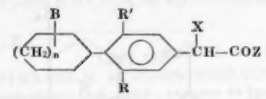
1. A compound of the formula:

3,852,323
PHENYLACETIC ACIDS

Julius Diamond, Lafayette Hill, and Norman Julian Santora, Roslyn, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 34,870, May 5, 1970,. This application June 11, 1971, Ser. No. 152,387
Int. Cl. C07c *63/54, 65/14, 121/64*
U.S. Cl. 260—465 D **42 Claims**

1. A compound of the formula



where:

n is 0–2;

B is hydrogen or loweralkyl;

R is halo, nitro, loweralkylsulfonyl, trifluoromethyl or cyano;

R′ is fluoro, chloro, bromo, trifluoromethyl, cyano, nitro or loweralkylsulfonyl

X is halo;

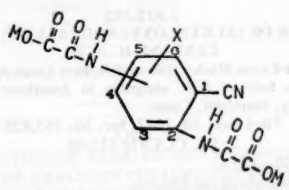
Z is —OH, loweralkoxy, phenyl loweralkoxy, —OM where M is an alkali, alkaline earth or aluminum metal or an ammonium salt which is pharmaceutically acceptable.

3,852,324
N,N-(CYANO-PHENYLENE) DIOXAMIC ACIDS

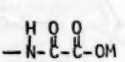
John B. Wright, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 20, 1972, Ser. No. 316,975
Int. Cl. C07c *121/78*
U.S. Cl. 260—465 D **7 Claims**

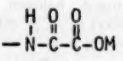
1. A compound of the formula



wherein M is selected from the group consisting of hydrogen and a pharmaceutically acceptable metal or an amine cation and



is at one of the positions 4,5 and 6 with the proviso that when



is at 4, then when X is at the three position, X is selected from the group consisting of hydrogen and alkyl from one to three carbon atoms, inclusive;

when X is at the 5 position, X is selected from the group consisting of hydrogen, halogen, alkoxy from one to three carbon atoms, inclusive, and cyano; and

when X is at the 6 position, X is selected from the group consisting of hydrogen and halogen;

5, then when X is at the 3 or 6 position, X is hydrogen; and when X is at the 4 position, X is selected from the group consisting of hydrogen, halogen, alkyl from one to three carbon atoms, inclusive; and alkoxy from one to three carbon atoms, inclusive;

6, when X is at the 3 or 5 position, X is selected from the group consisting of hydrogen and alkyl from one or three carbon atoms, inclusive; and

when X is at the 4 position, X is selected from the group consisting of hydrogen alkyl from one to three carbon atoms, inclusive, and cyano.

3,852,325
SELECTIVE ISOMERIZATION OF PENTENENITRILES

Charles M. King, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 29, 1973, Ser. No. 392,515
Int. Cl. C07c *121/30*
U.S. Cl. 260—465.9 **7 Claims**

1. A process for isomerizing a pair of geometric isomers of the group consisting of cis- and trans-2-pentenenitrile and cis- and trans-3-pentenenitrile in a mixture of these pentenenitriles, the geometric pair initially being present in a ratio greater than 1.19 trans-2-pentenenitrile/cis-2-pentenenitrile or 8.0 trans-3-pentenenitrile/cis-3-pentenenitrile and bringing the geometric pair of isomers to its equilibrium ratio said equilibrium ratio of trans-2-pentenenitrile to cis-2-pentenenitrile being 1.19 and 8.0 for trans-3-pentenenitrile to cis-3-pentenenitrile was substantially no carbon-carbon double bond migration,

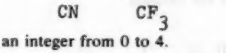
which comprises contacting the mixture of pentenenitriles at a temperature in the range of 90°–200°C. with from 1 to 40% by weight, based on the weight of the pentenenitriles, of a catalyst consisting essentially of a compound of the formula R_3CX wherein R is an aryl radical having up to 18 carbon atoms and X is of the group consisting of —H, —Cl, —Br, —SH, —I, $-B(C_6H_5)_4$, $-AsF_6$, $-SbF_6$, $-PF_6$ and $-BF_4$.

3,852,326
CYANOPERFLUORO(VINYL ETHERS), THEIR PREPARATION AND COPOLYMERS THEREOF

James E. Nottke, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 14, 1972, Ser. No. 262,590
Int. Cl. C07c *121/02, 121/30*
U.S. Cl. 260—465.6 **8 Claims**

1. A cyanoperfluoro(vinyl ether) of the formula



where *n* is an integer from 0 to 4.

3,852,327
SELECTIVE CIS/TRANS ISOMERIZATION OF 2-PENTENENITRILE IN A SOLUTION OF PENTENENITRILE ISOMERS

Joe D. Druliner, Orange, Tex., and Charles M. King, Arundel, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 29, 1973, Ser. No. 392,514
Int. Cl. C07c *121/30*
U.S. Cl. 260—465.9 **8 Claims**

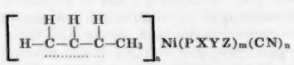
1. A process for altering the isomer ratio of cis-2-pentenenitrile to trans-2-pentenenitrile in a product stream consisting essentially of cis-2-pentenenitrile, trans-2-pentenenitrile, 3-pentenenitrile and 4-pentenenitrile, the cis-/trans-2-pentenenitrile ratio not being at the equilibrium ratio and bringing the mixture closer to the equilibrium cis-/trans-2-pentenenitrile ratio while effecting substantially no isomerization of 3-pentenenitrile to 2-pentenenitrile, which comprises contacting the mixture of pentenenitriles at a temperature in the range of 25°–200°C. with from 0.1 to 50% by weight, based on the total reaction mixture, of a catalyst composition consisting essentially of a Lewis acid and a Lewis base, the mole ratio of the Lewis acid to Lewis base being from about 1:5 to about 5:1.

3,852,328
CATALYTIC ISOMERIZATION OF 2-METHYL-3-BUTENENITRILE TO A LINEAR PENTENENITRILE

Yuan-Tsan Chia, Wilmington, Del., and William C. Seidel, Orange, Tex., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 26, 1973, Ser. No. 401,073
Int. Cl. C07c *121/30*
U.S. Cl. 260—465.9 **8 Claims**

1. A process of isomerizing 2-methyl-3-butenenitrile and thereby producing 3-pentenenitrile which comprises contacting the 2-methyl-3-butenenitrile at a temperature of 0° to 120°C. with a catalyst consisting essentially of a π-allyl nickel complex of the formula



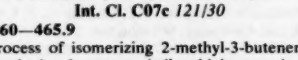
wherein PXYZ is a sigma-pi bonding ligand in which X is OR, Y and Z are R or OR and R is an aryl radical or an alkyl hydrocarbyl radical having up to 18 carbon atoms, wherein the R radicals of a given ligand are so chosen that the ligand has a cone angle in the range of 130° to 170°, *a* has a value of 1, *m* has a value of 1–2 and *n* has a value of 1, the mole ratio of 2-methyl-3-butenenitrile to catalyst being in the range of 1:2 to 2,000:1.

3,852,329
PROCESS FOR ISOMERIZATION OF 2-METHYL-3-BUTENE-NITRILE TO A LINEAR PENTENENITRILE

Peter E. Tomlinson, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 2, 1973, Ser. No. 402,905
Int. Cl. C07c *121/30*
U.S. Cl. 260—465.9 **12 Claims**

1. A process of isomerizing 2-methyl-3-butenenitrile and thereby producing 3-pentenenitrile which comprises contacting 2-methyl-3-butenenitrile in a reactor at a temperature in the range of 10° to 200°C. with a catalyst consisting essentially of a nickel complex of the group consisting of a zerovalent nickel compound of the formula $Ni(PXYZ)_4$ and a π-allyl nickel compound of the formula



wherein PXYZ is a sigma-pi bonding ligand in which X is OR, Y and Z are R or OR and R is of the group consisting of alkyl and aryl radicals of up to 18 carbon atoms wherein for the π-allyl nickel compound the R radicals of a given PXYZ ligand are so chosen that the ligand has a cone angle of 130° to 170°; *a* has a value of 1, *m* has a value of 1–2 and *n* has a value of 1, wherein the 2-methyl-3-butenenitrile and the catalyst are contacted with an activated crystalline metal aluminosilcate zeolite molecular sieve having substantially uniform pore diameters in the range of about 3A to about 13A.

3,852,330
BOLL WEEVIL SEX ATTRACTANT

Rene C. Zurfluh, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 870,009, Oct. 22, 1969, abandoned. This application May 5, 1972, Ser. No. 250,546
Int. Cl. C07c *61/36*, *69/74*
U.S. Cl. 260—468 H **3 Claims**

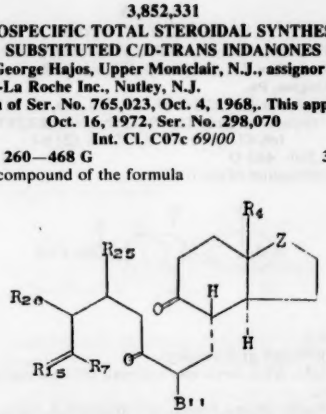
1. The compound, cis 1-methyl-2-acetyl-cyclobutylacetic acid and lower alkyl esters thereof.

3,852,331
STEREOSPECIFIC TOTAL STEROIDAL SYNTHESIS VIA SUBSTITUTED C/D-TRANS INDANONES

Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 765,023, Oct. 4, 1968,. This application Oct. 16, 1972, Ser. No. 298,070
Int. Cl. C07c *69/00*
U.S. Cl. 260—468 G **3 Claims**

1. A compound of the formula



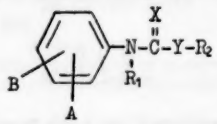
wherein R_{15} is selected from the group consisting of oxo, lower alkylenedioxy or (hydrogen and lower alkoxy);B''is selected from the group consisting of lower alkoxycarbonyl, lower aryloxy-carbonyl, cyano, lower alkyl sulfinyl, lower alkyl sulfonyl; R_{25} and R_{26} are independently selected from the group consisting of hydrogen, hydroxyl and lower alkyl; Z is selected from the group consisting of carbonyl, lower alkylenedioxy or $CH(OR_8)$; R_6 and R_7 are both lower alkyl and R_8 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl-lower alkyl, tetrahydropyranyl, lower alkanoyl, benzoyl, nitrobenzoyl, carboxy-lower alkanoyl, carboxy-benzoyl, trifluoroacetyl, or camphorsulfonyl.

3,852,332
ESTERS OF (ALKYNLOXY) AND (ALKENYLOXY) CARBANILIC ACID

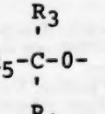
Barrington Cross, Rocky Hill, and Robert Louis Arotin, Willingboro, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 30, 1972, Ser. No. 267,838
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C **10 Claims**

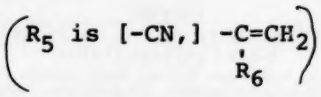
1. Compounds of the formula:



wherein A is hydrogen, halogen, alkyl (C_1–C_4), alkoxy (C_1–C_4), monohaloalkyl (C_1–C_4), dihaloalkyl (C_1–C_4), trihaloalkyl (C_1–C_4), or nitro; B is



X and Y are oxygen; R_1 is hydrogen or alkyl (C_1–C_4); R_2 is alkyl (C_1–C_{10}), cycloalkyl (C_3–C_7), benzyl, chlorobenzyl, methylbenzyl, phenyl, chlorophenyl, methylphenyl, alkenyl (C_2–C_6), monohaloalkenyl (C_2–C_6), alkynyl (C_2–C_6), monohaloalkenyl (C_2–C_6), alkynyl (C_2–C_6), monohaloalkynyl (C_2–C_6) or monomethoxyalkynyl (C_2–C_6); R_3 and r_4 are hydrogen or methyl;



or 13 C C—R_7; R_6 is hydrogen, methyl or halogen; and R_7 is hydrogen, halogen, alkyl (C_1–C_4), alkoxyalkyl (C_2–C_6) or haloalkyl (C_1–C_4), provided that A and B are respectively attached to the carbons in the ring which are meta- and para- or para- and meta- to the carbon attached to the nitrogen; and provided that when B is CH_2=$CHCH_2O$—, X is oxygen.

3,852,333

NEW ANTHRANILIC ACIDα-MONOGLYCERIDES

James R. Fisher, Royal Oak, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Oct. 23, 1967, Ser. No. 677,051

Int. Cl. C07c *101/54*

U.S. Cl. 260—471 R **2 Claims**

1. A compound which is 2,3-dihydroxypropyl N-(2,3-xylyl)anthranilate.

3,852,334

SUBSTITUTED CARBAZIC ACID ESTERS

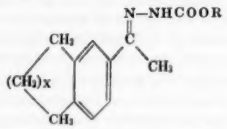
John Paul Dusza, Nanuet; Harry Lee Lindsay, Pearl River, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 17, 1973, Ser. No. 425,422

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C **3 Claims**

1. A compound of the formula:



wherein R is lower alkyl (C_1 to C_6) and X is 1 or 2.

3,852,335

SEPARATION OF BASIC INORGANIC COMPOUNDS FROM THE REACTION MIXTURE OBTAINED IN THE MANUFACTURE OF HYDROXYPIVALIC ACID NEO-PENTYLGLYCOL ESTER (2,2-DIMETHYL-1,3-PROPANEDIOL-HYDROXYPIVALIC MONOESTER

Franz Merger, Frankenthal, and Gerd Duembgen, Dannstadt, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed July 9, 1973, Ser. No. 377,613

Int. Cl. C07c *60/66*

U.S. Cl. 260—484 R **3 Claims**

1. A process for separating basic inorganic compounds from the reaction mixture obtained in the conversion of hydroxypivalaldehyde to hydroxypivalic acid neopentylglycol ester in the presence of basic catalysts, wherein formic acid is added to the reaction mixture, which is then filtered.

3,852,336

ANTHELMINTIC COMPOUNDS

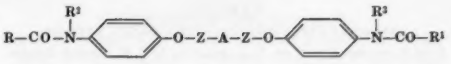
Morton Harfenist, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Triangle Park, N.C.

Filed Feb. 25, 1972, Ser. No. 229,563

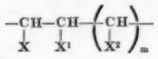
Int. Cl. C07c *69/40, 69/48*

U.S. Cl. 260—485 J **5 Claims**

1. The compound of the formula



wherein R and R^1 are the same or different and each is hydrogen, a saturated aliphatic hydrocarbon group having 1 to 7 carbon atoms or an unsaturated aliphatic hydrocarbon group having 2 to 4 carbon atoms; R^2 and R^3 are the same or different and each is hydrogen or an alkyl having 1 to 4 carbon atoms; Z is the group



where *m* is 0 or 1, and X, X^1 and X^2 are the same or different and each is hydrogen or an alkyl group having 1 to 3 carbon atoms;

A is 0 —Y — 0 and Y is =CO — $(W)_l$—$(CO)_p$ — wherein W is an unsubstituted aliphatic hydrocarbon residue having 1 to 12 carbon atoms, and p is 1.

3,852,337

PGF TETRAOLS AND ALKANOYL ESTERS

Sune Bergstrom, and Jan Sjovall, both of Kemiska Institutionen Karolinska Institutet, Stockholm 60, Sweden

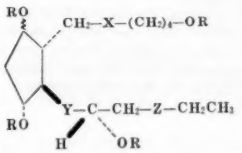
Continuation of Ser. No. 115,110, Feb. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 203,752, June 20, 1962, Pat. No. 3,598,858, which is a continuation-in-part of Ser. No. 199,209, April 9, 1962, abandoned, which is a continuation-in-part of Ser. No. 738,514, May 28, 1958, Pat. No. 3,069,322. This application Aug. 23, 1972, Ser. No. 282,952

Claims priority, application Great Britain, Mar. 29, 1962, 12139/62

Int. Cl. C07c *35/06, 69/20, 69/32*

U.S. Cl. 260—488 R **27 Claims**

1. A compound of the formula:



wherein Y is —CH_2CH_2— or trans—CH=CH—, and both X and Z are —CH_2CH_2—, or wherein Y is trans—CH=CH—, X is cis—CH=CH—, and Z is —CH_2CH_2— or cis—CH=CH—, wherein R is hydrogen or lower alkanoyl, all R groups being the same, and wherein ~ indicates attachment of —OR to the ring in alpha or beta configuration.

3,852,338

N-SUBSTITUTED PHENYLALANINE DERIVATIVES

Ado Kaiser, Neu-Frenkendorf; Wolfgang Koch, Riehen; Marcel Scheer, Basel, and Uwe Wolcke, Bottmingen, all of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed Oct. 21, 1971, Ser. No. 191,486

Claims priority, application Switzerland, Oct. 30, 1970, 16043/70

Int. Cl. C07c *101/08*

U.S. Cl. 260—501.12 **2 Claims**

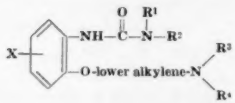
1. N-[(o-nitrophenyl)-thio]-L-dopa or salts thereof with pharmaceutically acceptable acids or bases.

3,852,339
AMINOALKOXYPHENYLUREA DERIVATIVES

John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 46,520, June 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 760,072, Sept. 16, 1968, abandoned. This application Jan. 25, 1972, Ser. No. 220,699
Int. Cl. C07c *127/16*
U.S. Cl. 260—501.12 9 Claims

1. A compound having the formula



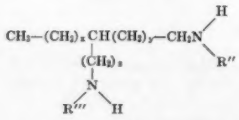
or a salt thereof with pharamaceutically acceptable acids, wherein the X is hydrogen, halogen, trifluoromethyl, lower alkyl or lower alkoxy; R^1 and R^2 and R^3 and R^4 are the same or different and each is hydrogen, lower alkyl, allyl, cyclo-lower alkyl, phenyl or X-phenyl.

3,852,340
PLANT HORMONE CARBOXYLIC ACID SALTS OF ALIPHATIC POLYAMINES

Richard A. Reck, Hinsdale, and Walter W. Abramitis, Downers Grove, both of Ill., assignors to Akzona Incorporated, Ashville, N.C.

Continuation-in-part of Ser. No. 581,725, Sept. 26, 1966, Pat. No. 3,683,010, which is a continuation-in-part of Ser. No. 300,108, Aug. 5, 1963, abandoned. This application Apr. 21, 1970, Ser. No. 30,608The portion of the term of this patent subsequent to Aug. 8, 1989, has been disclaimed.
Int. Cl. C07c *87/14*
U.S. Cl. 260—501.16 8 Claims

1. A plant hormone carboxylic acid salt of an aliphatic polyamine selected from the group consisting of aminostearylamine, aminomethylstearylamine, aminoundecylamine, and aminomethylundecylamine and γ-aminopropyl derivatives thereof having the following formula:



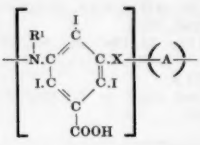
wherein
$x = 0$ to 15
$y = 0$ to 15
$z = 0$ or 1
$x + y = 8$ or 15
R''', $R'' = H$ or γ-aminopropyl
said plant hormone carboxylic acid being selected from the group consisting of 2,4-dichlorophenoxyacetic acid; 2,4,5-trichlorophenoxyacetic acid; methylchlorophenoxyacetic acid; chlorinated benzoic acid; dichloropropionic acid; β-indolylacetic acid α-naphthaleneactic acid; indolylbutyric acid; indolylpropionic acid; phenylacetic acid; fluoroacetic acid; 2,5-dichloro-3-nitrobenzoic acid; 3-amino-2,5-dichlorobenzoic acid, and 3,6-endoxohexahydrophthalic acid.

3,852,341
NOVEL IODINE CONTAINING POLYMERS USEFUL AS X-RAY CONTRAST AGENTS

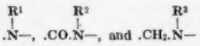
Lars Bjork; Uno Eugen Erikson; Kirsti Annikki Granath; Bjorn Gustav-Adolf Ingelman, and Bernt Jabes Lindberg, all of Uppsala, Sweden, assignors to Pharmacia Aktiebolag, Uppsala, Sweden

Division of Ser. No. 869,926, Oct. 27, 1969, Pat. No. 3,733,397 which is a division of Ser. No. 686,340, Nov. 28, 1967, abandoned and 775,920, Nov. 14, 1968, abandoned. This application Apr. 26, 1971, Ser. No. 137,665
Int. Cl. C07c *101/54*, *103/30*
U.S. Cl. 260—519 10 Claims

1. A polymer consisting of repeating units of the formula



wherein X is a member selected from radicals having the formulas



where R^1 and R^3 each are a member selected from the group consisting of hydrogen, alkanoyl and alkyl having each no more than 5 carbon atoms and R^2 is a member selected from the group consisting of hydrogen and alkyl having no more than 5 carbon atoms, and wherein A is an alkylene group substituted by at least one hydroxyl group, said alkylene containing 3–30 carbon atoms, and being broken by at least one oxygen bridge and said polymer being built up of alternating 2,4,6-triiodobenzoic acid derivative groups of the formula indicated above and the groups A and said polymer containing at least three such 2,4,6-triiodobenzoic acid derivative groups and having an average molecular weight of at least 1900 and physiologically acceptable salts thereof.

3,852,342
PROCESS FOR THE LIQUID PHASE OXIDATION OF METHYLAROMATIC COMPOUNDS INTO POLYCARBOXYLIC ACIDS

Jacques D. V. Hanotier, Brussels, Belgium, assignor to Labofina S.A., Brussels, Belgium

Filed Sept. 1, 1972, Ser. No. 285,733
Int. Cl. C07c *63/02*
U.S. Cl. 260—524 R 6 Claims

1. A process for the liquid phase oxidation of methylaromatic compounds having at least one methyl substituent on a nuclear carbon atom vicinal to another nuclear carbon atom substituted by a radical selected from the group consisting of methyl, hydroxymethyl, formyl and carboxyl radicals, to form aromatic polycarboxylic acids having at least two carboxyl groups on vicinal nuclear carbon atoms, which process comprises reacting in acetic acid said methylaromatic compounds with a cobalt salt while maintaining such a concentration of cobaltic ions that $2x$-A is at least 0.4, x and A being respectively the molarity of said cobaltic ions and said cobalt salt in the reaction mixture, at a temperature of between 20 and 100°C and in the presence of molecular oxygen at a partial pressure of from 0.2 to 20 atmospheres.

3,852,343

A PROCESS FOR THE PRODUCTION OF BENZENE CARBOXYLIC ACIDS FROM ETHYL SUBSTITUTED BENZENES

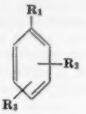
Jacques D. V. Hanotier, and Pierre M. J. G. DeRadzitzky D'Ostrowick, both of Brussels, Belgium, assignors to Labofina S.A., Brussels, Belgium

Continuation of Ser. No. 129,250, March 29, 1971, abandoned. This application June 26, 1973, Ser. No. 374,792

Int. Cl. C07c *63/02*

U.S. Cl. 260—524 R 7 Claims

1. A process for the production of benzene carboxylic acids, which comprises reacting ethyl-substituted benzene compounds having the general formula



where R_1 is an ethyl radical, R_2 and R_3 are each a member of the group comprising hydrogen and ethyl, acetyl, 1-hydroxyethyl, 1-acetoxyethyl and carboxyl radicals, said radicals being spaced apart from at least one unsubstituted nuclear carbon atom, with molecular oxygen at a temperature between 120° and 200°C in a solvent mixture consisting of acetic acid and water in a volume ratio of between 1:1 and 5:1, acid to water, the amount of said solvent mixture employed being such that at least 10 percent of the reaction mixture is water, and wherein the volume ratio of said solvent mixture to said ethyl-substituted benzene compound is between 1:1 and 10:1 in the presence of a catalyst mixture consisting essentially of a cobalt carboxylate, said cobalt carboxylate present in an amount of 0.010 to 0.100 mole per liter of reaction mixture, and a manganese carboxylate, said manganese carboxylate present in an amount of 0.001 to 0.010 mole per liter of reaction mixture, said carboxylates being soluble in the reaction mixture, and maintaining the concentration of unreacted ethyl-substituted benzene compound in the reaction mixture at a value of at least 5 percent by volume on a solvent-free basis.

3,852,344

PROCESS FOR RECOVERING IMINODIACETIC ACID FROM SODIUM CHLORIDE SOLUTIONS

Robert W. Bragdon, Marblehead, Mass.; Jon C. Thunberg, Amherst, and William P. Moore, Durham, both of N.H., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 319,539, Dec. 29, 1972, Pat. No. 3,808,269. This application Nov. 15, 1973, Ser. No. 416,027

Int. Cl. C07c *99/12*

U.S. Cl. 260—534 E 24 Claims

1. A process for recovering iminodiacetic acid from an aqueous solution consisting essentially of water, iminodiacetic acid, and sodium chloride, the mole ratio of iminodiacetic acid to sodium chloride being 1:1.0–15.0, said solution having a temperature of about 0°–50°C and containing at least about 5 percent iminodiacetic, said process comprising adjusting the pH of said aqueous solution to 1.4–3.0 to precipitate iminodiacetatic acid therefrom; separating the precipitated iminodiacetic acid; and recovering the separated iminodiacetic acid.

3,852,345

HERBICIDES AND FUNGICIDES

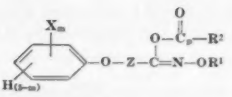
Sidney B. Richter, Chicago, and Leonard J. Stach, Riverside, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 782,716, Dec. 10, 1968, abandoned. This application Dec. 23, 1970, Ser. No. 101,191The portion of the term of this patent subsequent to Mar. 14, 1989, has been disclaimed.

Int. Cl. C07c *119/00*

U.S. Cl. 260—545 R 2 Claims

1. A compound of the formula



wherein X is selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, lower alkylthio, halogen, nitro, amino, lower alkylamino, di(lower alkyl)amino and cyano; *m* is an integer from 0 to 5; Z is a carbon chain of from 1 to 4 carbon atoms; R^1 is lower alkyl; *p* is 1; and R^2 is selected from the group consisting of lower alkylamino and di(lower alkyl-)amino.

3,852,346

PRODUCTION OF CARBOXYLIC ACID ANHYDRIDES

Denis Forster, University City; Arnold Hershman, and Frank E. Paulik, both of Creve Coeur, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1972, Ser. No. 318,125

Int. Cl. C07c *51/14*

U.S. Cl. 260—546 10 Claims

1. An improved process for the production of carboxylic acid anhydrides by the reaction of ethylenically unsaturated feedstock compounds having from 2 to 30 carbon atoms, which comprises contacting the said compound with carbon monoxide, and at least one reactant selected from the group consisting of carboxylic acids having from 2 to 30 carbon atoms and water, at a temperature from 50°C to 300°C and a partial pressure of carbon monoxide of 1 psia to 2,000 psia, the improvement comprising the production of carboxylic acid anhydrides in the presence of a catalyst system consisting essentially of:

1. a rhodium or iridium compound, and
2. an iodide component subject to the conditions that the atomic ratio of iodide to rhodium or iridium is from 1:1 to 300:1, and
3. hydrogen as a catalyst preserver or regenerator component in a molar ratio of 5:1 to 10,000:1 to the rhodium or iridium with the proviso that when the process is conducted in the presence of both carboxylic acids having from 2 to 30 carbon atoms and water as reactants, the ratio of moles of water fed to the reactor per mole of carbon monoxide consumed is less than 0.5, and that when the reactant of the group of carboxylic acids and water, is water, the ratio of moles of water fed to the reactor per mole of carbon monoxide consumed is at least 0.5 but less than 1.0.

3,852,347

SUBSTITUTED CYCLOALKYL UREAS

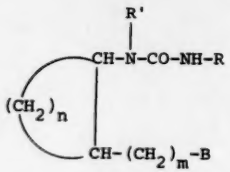
John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 15, 1972, Ser. No. 289,394

Int. Cl. C07c *127/18*

U.S. Cl. 260—553 A 2 Claims

1. A compound of the formula

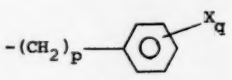


or salts thereof with pharmaceutically acceptable acids wherein

n is 3, 4, 5 or 6;

R′ is H or alkyl of from 1 to 6 carbon atoms;

R is H, alkyl of from 1 to 6 carbon atoms, or a radical of the formula



wherein

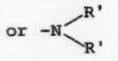
p is 0, 1, 2 or 3;

X is F, Cl, Br or I, CF_3, nitro, amino, alkyl of from 1 to 6 carbon atoms or —OR wherein R is H, alkyl of from 1 to 6 carbon atoms, cycloalkyl of from 5 to 8 carbon atoms, or benzyl; and

q is 0 or 1;

m is 1, 2, or 3; and

B is pyrrolidino, piperidino,



wherein R′ is as defined previously.

3,852,348

ETHER AND SULFIDE META-SUBSTITUTED PHENYL UREAS

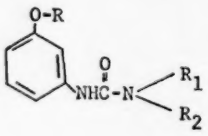
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 90,854, Nov. 18, 1970, abandoned. This application Mar. 12, 1973, Ser. No. 340,142

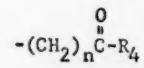
Int. Cl. C07c *127/18*

U.S. Cl. 260—553 A **9 Claims**

1. A compound having the formula



in which R is ketoalkyl of the formula



wherein n is 1 or 2 and R_4 is straight or branched chain alkyl having 1 to 4 carbon atoms, inclusive, R_1 is hydrogen or lower alkyl having 1 to 4 carbon atoms, inclusive, R_2 is lower alkyl having 1 to 4 carbon atoms, inclusive, or alkenyl having 3 to 6 carbon atoms, inclusive.

3,852,349

REACTION OF PEROXIDES WITH NITRILES

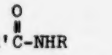
John O. Turner, West Chester, Pa., and Richard V. Norton, Wilmington, Del., assignors to Sun Ventures, Inc., St. Davis, Pa.

Continuation-in-part of Ser. No. 144,345, May 17, 1971, abandoned. This application Oct. 20, 1972, Ser. No. 299,508

Int. Cl. C07c *103/08*

U.S. Cl. 260—558 R **10 Claims**

1. A process for the preparation of an N-alkyl amide of the formula



wherein R is a secondary or tertiary aliphatic or alicyclic group having from 3 to 12 carbon atoms and R′ is an alkyl, alkenyl, aryl or aralkyl group having from 1 to 20 carbon atoms, and wherein the aryl group may be unsubstituted or substituted with substituents which are inert to the conditions of the reaction, said inert substituents comprising hydroxy, nitro, mercapto, lower alkoxy, lower alkyl, and halo groups, which comprises reacting a nitrile of the formula R′CN with a peroxide compound of the formula ROOR or ROOH, wherein R and R′ are as defined above, in an alkanol-acid medium, wherein said acid is a mineral acid, sulfonic acid, p-toluene sulfonic acid, or an acid-treated molecular sieve, at a temperature in the range of from about 10° to 80°C.

3,852,350

PROCESS OF PREPARING AMIDES

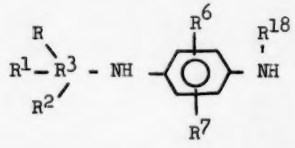
Farris H. Wilson, Jr., Cuyahoga Falls, and Thomas J. Slam, Parma, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 5, 1972, Ser. No. 286,476

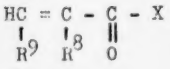
Int. Cl. C07c *103/44*

U.S. Cl. 260—562 P **11 Claims**

1. A process of preparing an amide by reacting an aromatic amine with an acid chloride in an aprotic solvent solution thereof in the presence of an inorganic neutralizing agent and a catalytic amount of a tertiary amine, wherein the aromatic amine, neutralizing agent and tertiary amine are combined in the aprotic solvent, said combination then being combined with the acid chloride at a temperature of less than 50° C., and the reaction occurring at a temperature of less than 50° C., wherein at least one mole equivalent of the neutralizing agent is used per mole of aromatic amine and wherein the catalytic amount of the tertiary amine is 0.0033 mole to 0.20 mole per mole of aromatic amine and wherein the aromatic amine has the following structural formula

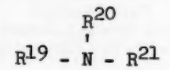


and the acid chloride has the following structural formula

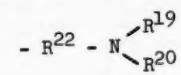


wherein R^3 is an aryl radical, R and R^1 are selected from the group consisting of hydrogen, alkyl radicals having from 1 to 4 carbon atoms and alkoxy radicals having from 1 to 4 carbon atoms, R^2 is selected from the group consisting of hydrogen,

alkyl radicals having from 1 to 4 carbon atoms and alkoxy radicals having from 1 to 4 carbon atoms and wherein R^6 and R^7 are selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms, R^8 is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 4 carbon atoms, aryl radicals having from 6 to 12 carbon atoms, aralkyl radicals having from 7 to 13 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms, carboxymethyl radical and carbalkoxymethyl radicals, and R^9 is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 4 carbon atoms, aryl radicals having from 6 to 12 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms, carboxyl radical and carbalkoxy radicals and wherein R^{18} is selected from the group consisting of hydrogen, alkyl radicals having 1 to 12 carbon atoms, cycloalkyl radicals having 5 to 12 carbon atoms and aralkyl radicals having 7 to 13 carbon atoms and wherein the tertiary amine has the following structural formula



wherein R^{19} and R^{20} are selected from the group consisting of alkyl radicals having 1 to 12 carbon atoms, cycloalkyl radicals having 5 to 10 carbon atoms, aralkyl radicals having 7 to 15 carbon atoms, hydroxy alkyl radicals having 2 to 12 carbon atoms, and hydroxy cycloalkyl radicals having 5 to 10 carbon atoms, and wherein R^{21} can be selected from the same group of radicals as R^{19} and R^{20} and in addition can be an aryl radical having 6 to 12 carbon atoms or a radical having the following structure



wherein R^{22} is selected from the group consisting of alkylene radicals having 1 to 6 carbon atoms, cycloalkylene radicals having 5 to 10 carbon atoms, and arylene radicals having 6 to 12 carbon atoms and wherein any two of the three radicals R^{19}, R^{20} and R^{21} can be combined to form a heterocyclic ring and wherein R^{19}, R^{20} and R^{21} can be combined to form an aromatic ring and wherein the inorganic neutralizer is selected from the group consisting of hydroxides, carbonates, bicarbonates and oxides, the anionic portion thereof being selected from the group consisting of sodium, potassium, barium, calcium, lithium, cesium and magnesium.

3,852,351

CHLORINATION OF ACETOACETAMIDES

William G. Scharpf, Yardley, Pa., assignor to FMC Corporation, New York, N.Y.

Filed Oct. 2, 1972, Ser. No. 294,458

Int. Cl. C07c *103/00*

U.S. Cl. 260—562 B **5 Claims**

1. A process for the production of alpha-chloroacetoacetamides comprising the direct chlorination with chlorine of acetoacetamides between 0° and 35°C, in a reaction medium consisting of a polar solvent and in the presence of a Lewis acid capable of causing enolization of the amide.

3,852,352

METHOD OF PRODUCING ALPHA-METHYL-1-ADAMANTYLMETHYL-AMINE HYDROCHLORIDE

Yanis Jurievich Polis, ulitsa Maskavas, 266/4, kv. 38, and Ilze Yanovna Grava, ulitsa Tallinas, 41/43, kv. 46, both of Riga, U.S.S.R.

Filed Dec. 30, 1971, Ser. No. 214,381

Claims priority, application U.S.S.R., Apr. 13, 1971, 1641577

Int. Cl. C07c *87/40*

U.S. Cl. 260—563 P **11 Claims**

1. A method of producing α-methyl-1-adamantylmethylamine hydrochloride comprising reacting 1-adamantylmethyl ketone with a mixture of acetamide and formic acid at the boiling temperature of the reaction mixture to form an acyl derivative of α-methyl-1-adamantylmethylamine, then hydrolyzing said acyl derivative with HCl and isolating the desired product.

3,852,353

ORAL HYPOGLYCEMIC AMINOPHENYLSULFONYL-HYDROCARBYLBIGUANIDES

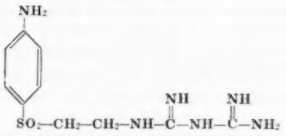
Clifford John Heaphy, 1635 Harvard N.E., Albuquerque, N. Mex. 87106

Filed Dec. 12, 1972, Ser. No. 314,545

Int. Cl. C07c *133/10*

U.S. Cl. 260—564 B **1 Claim**

1. A compound having the formula:



3,852,354

HIGHER ALKYL THIUROM SULFIDE

Teruyoshi Usamoto, Osaka; Yasutaka Hatada, Higashi-Osaka; Itsuro Furuichi, Yoyonaka City, and Masao Matsuo, Takatsuki, all of Japan, assignors to Sumitoma Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 70,934, Sept. 9, 1970, Pat. No. 3,706,819. This application Mar. 1, 1972, Ser. No. 230,957

Int. Cl. C07c *155/10*

U.S. Cl. 260—567 **1 Claim**

1. A chemical which is N,N′-diisopropyl-N,N′-dioctadecyl thiuram disulfide.

3,852,355

CYCLOALIPHATIC UNSATURATED KETONES AS ODOUR- AND TASTE-MODIFYING AGENTS

Valentin Rautenstrauch, 3, Grand-Lancy/Geneva, and Ferdinand Naf, Geneva, both of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

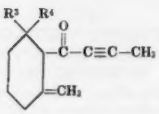
Filed Aug. 29, 1972, Ser. No. 284,467

Claims priority, application Switzerland, Aug. 31, 1971, 12755/71

Int. Cl. C07c *49/48*

U.S. Cl. 260—586 R **2 Claims**

1. A compound of the formula



wherein R^3 and R^4 represent lower alkyl radicals containing 1 to 6 carbon atoms.

3,852,356

PRODUCTION OF ALIPHATIC AND CYCLOALIPHATIC ALPHA-NITROKETONES

Hans Martin Weitz; Hans-Henning Vogel, both of Frankenthal; Kurt Kahr, Neustadt, and Hugo Fuchs, Ludwigshafen, all of Germany, assignors to Badische Anilin & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 6, 1972, Ser. No. 295,442

Claims priority, application Germany, Oct. 6, 1971, 2149821

Int. Cl. C07c *45/00, 49/06, 49/30*

U.S. Cl. 260—586 R **16 Claims**

1. A process for the production of an aliphatic or cycloaliphatic α-nitroketone which comprises: reacting a ketone selected from the group consisting of acetone, butanone-2, pentanone-3, methyl isobutyl ketone, cyclopentanone, cyclohexanone, cycloheptanone, cyclooctanone, cyclodecanone and cyclododecanone with concentrated nitric acid having a water content of less than 5.0 percent by weight in the presence of an inert solvent selected from the group consisting of halogenated hydrocarbons, nitroalkanes, nitrocycloalkanes, nitroaromatic hydrocarbons, aliphatic hydrocarbons, cycloaliphatic hydrocarbons, linear and cyclic sulfones, cyclic ethers, tetrahydrothiophene-1,1-dioxide, dimethoxy ethane and mixtures thereof with halogenated hydrocarbons, and at a reaction temperature of less than 90° C.

3,852,357

2 ALLYL-3-CHLORO-2-CYCLOHEXEN-1-ONES AND THEIR PREPARATION

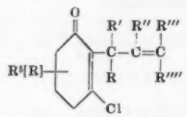
Jerry G. Strong, Fanwood, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 11,898, Feb. 16, 1970, abandoned. This application Jan. 18, 1973, Ser. No. 324,632

Int. Cl. C07c *49/48*

U.S. Cl. 260—586 R **6 Claims**

1. 2-allyl-3-chloro-2-cyclohexen-1-ones having the formula:



wherein R, R′, R″, R‴, R⁗ and R^5 are hydrogen or C_1–C_3 alkyl.

3,852,358

PROCESSES FOR REACTING DI-SUBSTITUTED DIENOPHILES WITH CYCLOPENTADIENE

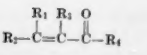
John B. Hall, Rumson, and James Milton Sanders, Eatontown, both of N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

Filed Dec. 7, 1972, Ser. No. 311,709

Int. Cl. C07c *45/00*

U.S. Cl. 260—586 G **12 Claims**

1. A process for producing cyclic derivatives which comprises reacting cyclopentadiene with a substituted dienophile having the formula



wherein R_1 and R_4 are alkyl groups, and one of R_2 and R_3 is an alkyl group and the other is hydrogen, the alkyl groups having from one to about three carbon atoms and being the same or different, in the presence of aluminum chloride, bismuth trichloride, stannic chloride, titanium tetrachloride, ferric chloride, or boron trihalide as a Lewis acid catalyst to obtain a cycloalkenyl derivative and in the presence of a liquid reaction hydrocarbon or halogenated hydrocarbon vehicle at a temperature of from about 0°C to 50°C.

3,852,359

2-(SULFUR-SUBSTITUTED)-3-HYDROXY-5,3-DIMETHYL-2-CYCLOHEXEN-1-ONES AND PREPARATION

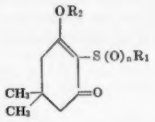
Joseph E. Dunbar, and Thomas J. Bohnert, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 29, 1972, Ser. No. 319,361

Int. Cl. C07c *49/80, 49/82*

U.S. Cl. 260—590 **15 Claims**

1. A 2-(sulfur-substituted)-3-hydroxy-5-dimethyl-2-cyclohexen-1-one corresponding to the formula



wherein R_1 represents benzyl, halobenzyl, lower alkylbenzyl or nitrobenzyl group, R_2 represents hydrogen, ammonium or alkali metal and *n* represents an integer from 0 to 2.

3,852,360

PREPARATION OF HYDROXYCITRONELLAL

Michel Vilkas, Paris, and Guy Senechal, Saint Cloud, both of France, assignors to L'Air Liquide Societe Anonyme Pour 'Etude et Exploitation des Procedes Georges Claude, Paris, France

Filed Sept. 18, 1970, Ser. No. 73,626

Claims priority, application France, Sept. 23, 1969, 69.3282

Int. Cl. C07c *47/26, 119/08*

U.S. Cl. 260—602 **10 Claims**

1. A process for the preparation of 7-hydroxy dihydrocitronellal, comprising:

reacting citronellal with a secondary lower alkyl amine or pyrrolidine, in liquid phase, to provide an enamine, at between about −30°C and ambient temperature;

converting said enamine to the immonium of citronellal by treatment in the liquid phase of said enamine in a 30% to 70% solution of sulfuric acid at between about −30° and 0°C;

heating the resultant reaction mixture to ambient temperature and maintaining at ambient temperature to hydrate said immonium citronellal to form immonium 7-dihydroxy citronellal;

hydrolysing said immonium 7-dihydroxy citronellal in the liquid phase to 7-hydroxy-dihydrocitronellal; and

recovering the 7-hydroxy dihydrocitronellal.

3,852,361

PRODUCTION OF FORMALDEHYDE

Hans Haas; Heinrich Sperber, and Wilhelm Friedrichsen, all of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed June 22, 1970, Ser. No. 48,444
Claims priority, application Germany, June 28, 1969, 1932892
Int. Cl. C07c *45/16*
U.S. Cl. 260—603 C 6 Claims

1. A process for the production of formaldehyde which comprises oxidizing methanol with oxygen at 280°-420°C. in the presence of a catalyst composed of iron oxide and molybdenum oxide deposited on a carrier consisting essentially of magnesium silicate particles having diameters of 4–12 millimeters and an internal surface area of 0.01 to 5 square meters per gram of said catalyst, said catalyst containing 5–20% by weight, based on said magnesium silicate carrier, of said iron oxide and said molybdenum oxide.

3,852,362

PREPARATION OF TERTIARY ORGANOPHOSPHINE OXIDES

Ronald F. Lambert, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 888,023, Dec. 24, 1969,. This application Aug. 27, 1973, Ser. No. 391,631
Int. Cl. C07f *9/28*
U.S. Cl. 260—606.5 P 8 Claims

1. A method of oxidizing a tertiary organophosphine to the corresponding tertiary organophosphine oxide which comprises treating a tertiary organophosphine of the formula $PR'R''R'''$ with aqueous alkali having a pH of at least 9 at a temperature between about 20°C. and 100°C. under in inert atmosphere, said tertiary organophosphine being soluble in said aqueous alkali and said R′, R″ and R‴ in the above formula each being selected from alkyl and phenyl and at least one of said R′, R″ and R‴ being substituted with a hydroxy group.

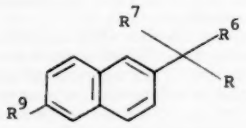
3,852,363

NAPHTHYL ACETALDEHYDE DERIVATIVES; METHOD OF USE THEREOF; AND PROCESSES FOR THE PREPARATION THEREOF

John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Panama, Panama

Division of Ser. No. 814,855, April 9, 1969, Pat. No. 3,663,713, which is a continuation-in-part of Ser. No. 741,900, July 2, 1968, Pat. No. 3,626,012. This application May 5, 1972, Ser. No. 250,733
Int. Cl. C07c *43/20*
U.S. Cl. 260—613 D 8 Claims

1. A compound of the formula:



wherein R is $—CHR^1R^2$; R^1 and R^2 are alkoxy having 1 to 6 carbon atoms, cycloalkoxy having 3 to 7 carbon atoms, benzyloxy, or 2-phenylethoxy;

one of R^6 and R^7 is hydrogen, the other is hydrogen, methyl, ethyl or difluoromethyl; or R^6 and R^7 taken together are methylene, halomethylene or ethylene;

and R^9 is lower alkoxy.

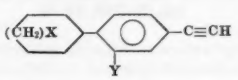
3,852,364

ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREFOR

Julius Diamond, Lafayette Hill, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Filed July 3, 1972, Ser. No. 268,419
Int. Cl. C07c *25/18*, *25/26*
U.S. Cl. 260—649 R 6 Claims

1. A compound of the formula:



where X is 0–2 and Y is halo.

3,852,365

PREPARATION OF PERCHLOROFLUOROBENZENES

Walter Mahler, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 5, 1973, Ser. No. 367,331
Int. Cl. C07c *25/00*
U.S. Cl. 260—650 F 8 Claims

1. Method of preparing perchlorofluorobenzenes which comprises heating a reaction mixture consisting essentially of two or more perhalobenzenes selected from the group consisting of hexachlorobenzene, hexafluorobenzene, and perchlorofluorobenzenes in which the number of chlorine or fluorine atoms in the components of the mixture differ by at least two at a temperature of at least 475°C. for a period of time sufficient to obtain a different perchlorofluorobenzene having an intermediate number of chlorine and fluorine atoms.

3,852,366

A COMPOSITION OF ISOMERIC TRICHLORODIFLUOROBENZENES

Max Fredrick Bechtold, Kennett Square, and Charles William Tullock, Landenberg, both of Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 172,513, Aug. 17, 1971, Pat. No. 3,774,393. This application Sept. 17, 1973, Ser. No. 397,724
Int. Cl. C07c *25/00*
U.S. Cl. 260—650 F 1 Claim

1. A composition consisting, by weight, of about 12% 1,3,5-trichloro-2,4-difluorobenzene, about 58% 1,2,4-trichloro-3,5-difluorobenzene, about 6% 1,2,3-trichloro-4,5-difluorobenzene, about 16% 1,2,5-trichloro-3,4-difluorobenzene, about 7% 2,3,4-trichloro-1,5-difluorobenzene and about 1% 1,3,4-trichloro-2,5-difluorobenzene.

3,852,367

STABILIZED TRICHLOROETHYLENE OR TETRACHLOROETHYLENE

Seiichi Katsuragawa, and Norihisa Koketsu, both of Saitama-ken, Japan, assignors to Central Glass Co., Ltd., Yamaguchi-ken, Japan

Filed Dec. 21, 1971, Ser. No. 210,576
Claims priority, application Japan, Dec. 23, 1970, 45-115687
Int. Cl. C07c *17/40*, *17/42*
U.S. Cl. 260—652.5 R 1 Claim

1. A stabilized composition consisting essentially of trichloroethylene or tetrachloroethylene and

a. 0.0001 to 1.0 weight percent of glycerin;

b. 0.00001 to 0.1 weight percent of at least one phenolic derivative selected from the group consisting of p-methoxyphenol, 2,6-di-tert.-butyl-4-methylphenol, p-

tert-butylphenol, p-sec-butyl-phenol and thymol;
c. 0.0001 to 0.1 weight percent of diisopropylamine; and
d. 0.001 to 1.0 weight percent of epichlorohydrin.

3,852,368

AMINE PROMOTERS FOR HYDROHALOGENATION

Jesse K. Boggs, Seabrook, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 13, 1971, Ser. No. 171,607
Int. Cl. C07c *17/16*
U.S. Cl. 260—657 **12 Claims**

1. In the liquid phase chlorination of a tertiary alcohol to produce the corresponding tertiary alkyl chloride by injecting gaseous hydrogen chloride into a liquid reaction medium containing said alcohol and from about 20 to about 50 weight percent of a hydrocarbon solvent which boils in the range between about 75° and about 360° F. and is an inert liquid at the chlorination temperature, the improvement which comprises adding from about 0.3 to about 15 weight percent of an amine promoter selected from the group consisting of tributylamine, triethylamine, n-butylamine, tetraethylammonium hydroxide, and pyridine to said medium, injecting said gaseous hydrogen chloride into said medium at a temperature between about 20° and about 100° F. and a pressure between about 0.5 and 100 psig, and recovering a tertiary alkyl chloride from said reaction medium.

3,852,369

PROCESSES FOR DEHYDROGENATION OF HYDROCARBONS

Darrell W. Walker; Brent J. Bertus, and Floyd Farha, Jr., all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 140,966, May 6, 1971, Pat. No. 3,781,223. This application May 24, 1973, Ser. No. 363,485
Int. Cl. C07c *5/18*
U.S. Cl. 260—680 E **8 Claims**

1. A process for the oxidative dehydrogenation of a paraffin hydrocarbon feedstock having from two to 12 carbon atoms which comprises contacting said feedstock with a catalyst consisting essentially of (1) at least one ferrous metal selected from the group consisting of nickel, iron and cobalt in an amount sufficient to add to the final catalyst from 26 to 75 weight percent ferrous metal, based on total weight of the final catalyst, (2) at least one tin-containing compound in an amount sufficient to add to the final catalyst about 1 to about 50 weight percent tin, and (3) phosphorus in an amount sufficient to add to the final catalyst about 0.5 to about 10 weight percent phosphorus, wherein at least one of said ferrous metal, tin or phosphorus is combined with oxygen.

3,852,370

OXIDATIVE DEHYDROGENATION WITH PROMOTED BARIUM FERRITE CATALYSTS

Robert E. Hinkson, and William H. Taylor, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 249,963, May 3, 1972, abandoned. This application Sept. 26, 1973, Ser. No. 400,755
Int. Cl. C07c *5/18*
U.S. Cl. 260—680 E **5 Claims**

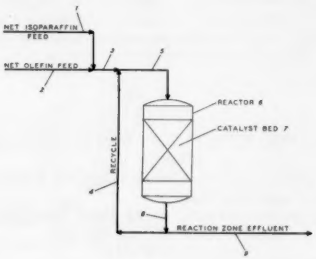
1. A process for the oxidative dehydrogenation of hydrocarbons having four to seven carbon atoms having a straight chain of at least 4 carbon atoms to produce less saturated hydrocarbons of the same number of carbon atoms which comprises contacting, at a temperature of greater than 400°C., said hydrocarbon, a halogen or halogen compound which would liberate halogen under the conditions of reaction and from 0.2 to 2.5 moles of oxygen per mole of said hydrocarbon with a catalyst for the dehydrogenation consisting essentially of barium ferrite and 0.35 to 1.3 moles per mole of barium ferrite of a metal oxide modifier selected from the group consisting of ZnO, MnO_2, PbO and mixtures thereof.

3,852,371

ISOPARAFFIN-OLEFIN ALKYLATION WITH A SUPPORTED HF ANTIMONY PENTAFLUORIDE CATALYST

Jacob D. Kemp, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 11, 1973, Ser. No. 350,222
Int. Cl. C07c *3/54*
U.S. Cl. 260—683.47 **6 Claims**



1. A process for alkylating olefins with isoparaffins which comprises
feeding a net feed of a C_2–C_5 olefin or mixtures thereof and a C_4–C_7 isoparaffin or mixtures thereof to an alkylation reaction zone,
therein contacting said feed with a catalyst comprising HF·antimony pentafluoride supported on a solid fluorided alumina base under reaction conditions including
a temperature between 10°F and 60°F,
an olefin LHSV through the reaction zone of between 0.25 and 0.9,
an olefin content in said olefin-isoparaffin net feed of between 1 and 15 volume percent,
withdrawing reaction zone effluent mix from said reaction zone, and
recycling a portion of said reaction zone effluent mix amounting to at least 2 parts of said mix per part of the olefin-isoparaffin net feed.

3,852,372

ISOMERIZATION WITH FLUORIDED COMPOSITE ALUMINA CATALYSTS

Robert M. Suggitt; John H. Estes, both of Wappingers Falls, and Stanley Kravitz, Wiccopee, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 49,958, June 25, 1970, Pat. No. 3,717,586. This application Feb. 2, 1972, Ser. No. 223,030
Int. Cl. B01j *11/16;* **C07c** *5/24;* **C01b** *33/28*
U.S. Cl. 260—683.68 **10 Claims**

1. An isomerization process which comprises contacting a feedstock containing C_{10}-C_{14} hydrocarbons at a temperature of from 200° to 1,000°F. in the presence of hydrogen with a catalyst comprising a hydrogenating component, alumina and from about 0.5 to 15.0 weight percent chemically combined fluorine, said chemically combined fluorine introduced by contacting alumina having associated therewith a hydrogenating component selected from the group consisting of the metals, oxides, sulfides and salts of the metals of Groups VIB and VIII of the Periodic Table and mixtures thereof with a combination of hydrogen and an organic fluoride compound containing from two to 16 carbon atoms corresponding to the formula $C_nF_aH_bX_c$ where X is nitrogen or oxygen and where n is 2 to 16, a is 1 to 2n+m, b is 0 to $2n+m-1$ and c is 1, where

m is equal to 2 when X is oxygen and *m* is equal to 3 when X is nitrogen, wherein the ratio of hydrogen to said fluoride compound is from 0.5 to 100 gram moles of hydrogen per gram atom of fluorine in said compound, at a temperature of from about 200° to 1,200°F.

3,852,373

PROCESS FOR THE PRODUCTION OF LIQUID BUTADIENE POLYMERS

Karl-Dieter Hesse, and Hans Von Portatius, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed May 9, 1972, Ser. No. 251,648

Claims priority, application Germany, May 10, 1971, 2122956

Int. Cl. C08f *1/52*

U.S. Cl. 260—680 B **5 Claims**

1. In a process for the production of gel-free liquid polybutadiene polymers having an average molecular weight of 500 – 10,000 and a viscosity of 50–50,000 cps measured at 20°C in the Hoepler fallingball viscometer according to Haake, and 30–90 percent cisdouble bonds, 10–70 percent trans-double bonds and less than 5 percent vinyl double bonds, at least 90 percent of the double bonds being centrally positioned, which process comprises polymerizing 1,3-butadiene in an inert diluent and in the presence of a negligible quantity of less than 2 percent by weight of oxygen and water based on the amount of catalyst with a catalytic amount of a mixed catalyst comprising

a. at least one diluent-soluble organonickel compound selected from the group consisting of nickel octoate, nickel oleate, nickel acetylacetonate, nickel tetracarbonyl, Ni[0]bis-cyclooctadiene, diallylnickel and dicyclopentadienyl-nickel, and

b. an alkylaluminum sesquihalide having 1–2 carbon atoms in the alkyl group, in a molar ratio of the nickel compound a) to the aluminum compound b) of 1:4 to 1:50, the improvement which comprises:

conducting the polymerization in the presence of a molecular weight regulating amount of 1–15 percent by weight ethylene or about 30 percent by weight propylene at a temperature of 10°–180°C to produce said liquid polybutadiene polymer.

3,852,374

TANNING AGENTS

Hans Erdmann, Heidelberg; Franz-Friedirch Miller, Ludwigshafen, and Alfred Zissel, Frankenthal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed Nov. 24, 1972, Ser. No. 309,471

Claims priority, application Germany, Nov. 26, 1971, 2158610

Int. Cl. C14c *3/20;* **C08g** *37/16*

U.S. Cl. 260—839 **5 Claims**

1. A process for the production of tanning agents based on condensation products by reaction of a sulfonated phenol devoid of condensed ring systems with formaldehyde, urea, melamine and/or dicyandiamide and a bisulfite, wherein

a. a condensation product from phenolsulfonic acid, urea and formaldehyde in a molar ratio of 1:1 to 1.5:1.2 to 2.2 and

b. a methylol compound of urea, melamine and/or dicyandiamide of a degree of sulfitation which corresponds to a molar ratio of bisulfite to nitrogenous compound of from 1:0.2 to 1:1.2 are reacted at 40°–80°C. at a pH in the range of 10 to 13 in a molar ratio of (a) to (b) of 1:1 to 1:9 and the product is then adjusted to a pH of from 3 to 5.

3,852,375

COATING COMPOSITIONS

Uwe Biethan, Marl; Jorg Dorffel, Lippramsdorf; Karl-Heinz Hornung, Marl, and Franz Riemhofer, Gossmannshofen, all of Germany, assignors to Chemische Werke Huls A.G., Marl, Germany

Filed Apr. 20, 1971, Ser. No. 135,691

Claims priority, application Germany, Apr. 22, 1970, 2019282

Int. Cl. C08g *37/34*

U.S. Cl. 260—850 **13 Claims**

1. In a coating composition having a viscosity of up to 500 poises and whose binder consists essentially of an aminoplast-ester mixture consisting of

A. 45–15 percent of at least one of an aminoplast component and a low-molecular precursor thereof, and

B. 55–85 percent by weight of a hydroxyl group-containing ester component having an acid number of less than 10 mg. KOH/g., and produced by the esterification of

I. an alcohol reactant consisting essentially of:

1. 0–50 percent of one or more aliphatic polyols of 3 or 4 hydroxyl groups and 3–6 carbon atoms, and

2. 100–50 molar percent of a diol component consisting essentially of:

a. at least 70 molar percent of one or both of ethylene glycol and 1,2-propanediol, and

b. 0–30 molar percent of one or more other aliphatic or cycloaliphatic diols whose hydroxyl groups are separated by 2–8 carbon atoms and 0–2 of the carbon atoms in the chain are substituted by oxygen atoms which are separated from each other and from the hydroxyl groups by at least 2 carbon atoms, and

II. an acid mixture consisting essentially of:

1. 80–20 molar percent of at least one aromatic or cycloaliphatic dicarboxylic acid whose carboxyl groups are positioned ortho or meta or a functional acid derivative thereof convertible to an ester of the alcohol reactant, and

2. 20–80 molar percent of at least one saturated aliphatic dicarboxylic acid of 4–12 carbon atoms or a functional acid derivative thereof convertible to an ester of the alcohol reactant the improvement wherein the coating composition contains from 0–20 percent solvent and the polyester has an average molecular weight of 200–400.

3,852,376

LOW SHRINKAGE UNSATURATED POLYESTER RESIN COMPOSITIONS CONTAINING GRAFT COPOLYMERS

Satoshi Bando; Kazuo Hara; Toshihiko Yoshitake, and Takeo Tasaka, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki City, Japan

Filed Jan. 30, 1973, Ser. No. 328,050

Claims priority, application Japan, Feb. 3, 1972, 47-12461; Mar. 30, 1972, 47-32340

Int. Cl. C08f *43/02, 43/08*

U.S. Cl. 260—862 **6 Claims**

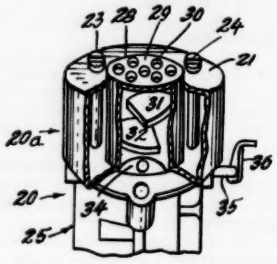
1. A low-shrinkage unsaturated polyester resin composition comprising an unsaturated polyester resin consisting of the uncured mixture of an essentially linear unsaturated polyester of a polycarboxylic acid dissolved in a cross-linking unsaturated monomer having radical copolymerizability with the unsaturated alkyd resin, and dispersed therein a powder of a polyolefinic resin graft polymerized with an unsaturated monomer capable of radical polymerication or copolymerization and of forming a polymer that is soluble or swellable in either or both components of the unsaturated polyester resin.

3,852,377

SPIT-BACK FOR CARBURATORS

Leo Heintzelman, 4990 Burlingame, Wyoming, Mich. 48104, and Albert G. Roy, R. No. 4, Box 103, Greenville, Mich. 48838

Filed June 19, 1972, Ser. No. 264,202
Int. Cl. F02m 17/30
U.S. Cl. 261—1 11 Claims



1. A spit-back device for a carburator having an air intake opening, said spit-back device comprising:

a hollow housing mounted over the air intake opening, said housing having a mixing chamber therein, with the mixing chamber having inlet means for introducing air into the mixing chamber and outlet means for delivering said air to the intake opening of the carburator, and

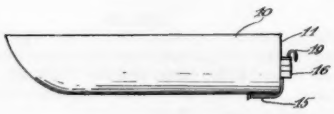
spaced baffle means mounted in the mixing chamber said baffle means and and extending across a portion of said chamber preventing any fuel and residue spit back from the carburator through the carburator intake opening into said housing from escaping from said housing inlet means.

3,852,378

WATER-PURIFYING ATTACHMENT FOR BOATS

Robert F. Guida, 744 Main St., Lake Geneva, Wis. 53147

Filed Oct. 3, 1973, Ser. No. 403,106
Int. Cl. B01f 3/04
U.S. Cl. 261—4 4 Claims



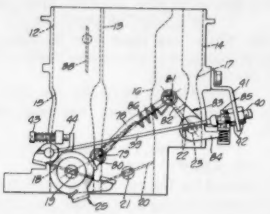
1. An attachment for a boat movable forwardly on a body of water, comprising a tube under the boat opening with one end forwardly to absorb water from said body during the advance of the boat, an upright tank carried by the boat and receiving the rear end of the tube at the bottom for said water to be received into and rise in the tank, a filling of filtering material in the tank and adapted to divest the water of impurities during its rise in the tank, and an outlet from the top region of the tank trained downwardly with a nozzle to direct a spray of the purified water toward said body, such spray designed to absorb oxygen from the air and further purify the water emitted by the spray.

3,852,379

CARBURETOR

Toshimasa Shishido, Tokyo, and Minoru Atsumi, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 30, 1973, Ser. No. 383,784
Int. Cl. F02m 11/04
U.S. Cl. 261—23 A 23 Claims



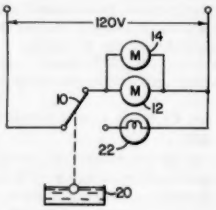
1. A carburetor assembly for use with an internal combustion engine having at least one main combustion chamber and an auxiliary combustion chamber connected thereto by a torch nozzle, said carburetor assembly having, in combination: a primary passage adapted to supply a lean mixture to the main combustion chamber of the engine, an auxiliary passage adapted to supply a rich mixture to the auxiliary combustion chamber of the engine, each of the passages having a throttle valve therein carried on a shaft, means mounting said shafts for turning movement, said means including a hollow stationary hub encircling a portion of one of said shafts, a member mounted to turn on the hub, means for applying a linear force to said member to cause it to turn in one direction, resilient means connected to turn the member in the other direction, means on an end of the shaft projecting from the hub connecting said member to turn said shaft, and means for coordinating turning movements of said shafts.

3,852,380

WATER LEVEL INDICATOR AND CONTROL

Woodrow W. Wiseman, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 24, 1973, Ser. No. 363,773
Int. Cl. B01f 3/04
U.S. Cl. 261—27 9 Claims



1. In a portable humidifier;

a cabinet;

a removable water container in the lower part of said cabinet;

electrically energized means for creating a flow of air adapted to be humidified through said cabinet;

a water level indicator and control assembly in the upper part of said cabinet including movable means carrying

water level indicia presented thereon, means biasing said movable means toward a full water level indication, means limiting movement of said movable means beyond said full water level indication, and switch means located to be operated by movement of said movable means to a position corresponding to a low water condition to control said electrically energized means;

a float;

flexible line means connected to said movable means at one end and connected to said float means at the other end, said line extending in a direction from said movable means that movement of said line in said lastmentioned direction opposes said biasing means; and

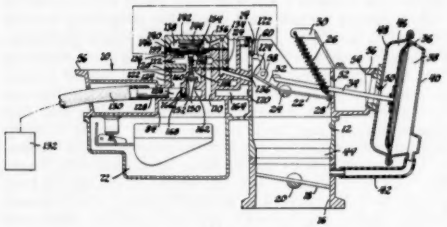
stop means on said line means, spaced apart from said float, and cooperating abutment means on said cabinet, for maintaining the portion of said line between said stop means and said movable means in tension and thereby preventing disengagement of said flexible line from said movable means when said float is moved to positions corresponding to positions in a direction above the position of full water level indication.

3,852,381

CARBURETOR

Stanley H. Mick, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1973, Ser. No. 343,554
Int. Cl. F02m *5/08*
U.S. Cl. 261—50 A **8 Claims**



1. An internal combustion engine carburetor comprising a mixture conduit, an air valve disposed in said mixture conduit, means controlling said air valve to maintain a region of substantially constant subatmospheric pressure in said mixture conduit downstream from said air valve during engine operation, a fuel bowl containing fuel up to a certain level therein, a fuel vapor passage opening from said fuel bowl above said level, said fuel vapor passage having a first branch extending to said mixture conduit and a second branch, valve means disposed in said vapor passage for alternatively directing the flow of fuel vapor through said first and second branches, said valve means including a diaphragm responsive to the pressure in said region to position said valve means for directing the flow of fuel vapor from said fuel bowl through said first branch to said mixture conduit during engine operation and for directing the flow of fuel vapor from said fuel bowl through said second branch when the engine is not operating.

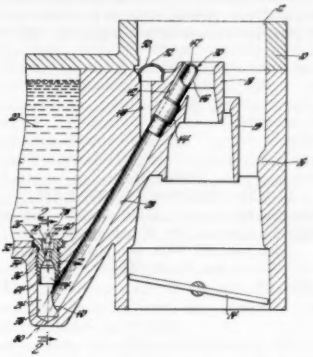
3,852,382

SKIRTED MAIN METERING JET FOR A CARBURETOR

George W. Wentis, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 11, 1973, Ser. No. 322,711
Int. Cl. F02m *7/22*
U.S. Cl. 261—51 **1 Claim**

1. A carburetor for an internal combustion engine comprising: a mixture conduit; a fuel supply; a fuel metering system interconnecting said fuel supply and said mixture conduit including a first downwardly extending vertical passage communicating with said fuel supply; an annular seating surface surrounding said vertical passage; a second passage in said fuel metering system angularly disposed with respect to said first passage, said second passage having an outlet at said mixture conduit and an inlet at said first passage, said inlet being variably axially disposed within a predetermined tolerance of said seating surface; a metering jet having a shank section disposed on said first bore and a head section having a flat annular surface adjacent the shank section seated against said seating surface; a cylindrical skirt on said shank section, said



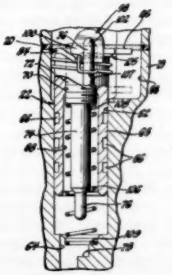
skirt having a diameter smaller than said shank section, extending substantially below said shank section, and terminating with a lower rim spaced a predetermined distance from said flat annular surface of said head section, said predetermined distance being sufficient to ensure that said rim extends axially below the edge of said inlet of said second passage for all locations of said inlet within said predetermined tolerance to ensure that fuel is discharged at said skirt interior of the projected envelope of said second passage thereby defining a uniform turning point for fuel passing from said jet to said second passage irrespective of the relative locations of said passages.

3,852,383

PART THROTTLE ADJUSTMENT

Jack L. Seaman, Fairport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 6, 1973, Ser. No. 386,008
Int. Cl. F02m *7/06*
U.S. Cl. 261—69 R **5 Claims**



1. A part throttle adjustment mechanism for a carburetor comprising: a housing having a bore therein exposed at one

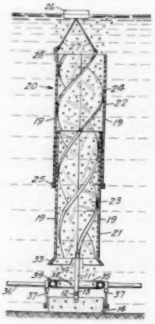
end to atmosphere and at the other end to a vacuum source, a power piston slidably supported for reciprocation in said bore and having an internal opening therethrough, an adjustment pin located within said opening, means on said piston for locating a metering rod within a metering jet, coacting means on said pin and said piston for adjustably positioning said piston along the length of said pin to adjust the part throttle position of said piston, a compression spring interposed between said adjustment pin and said housing having a fixed height when the piston is maintained in a part throttle position by a first vacuum level at the other end of said bore, said spring moving said piston to a fuel enrichment position in response to a predetermined reduced vacuum at the other end of said bore at all part throttle adjusted positions of said piston to provide extra enrichment of fuel supply through the metering jet.

3,852,384

LIQUID TREATMENT APPARATUS

John E. Bearden, Minneapolis, Minn., assignor to Environmental Technology Corporation, Bloomington, Minn.

Filed July 21, 1972, Ser. No. 273,734
Int. Cl. B01f *3/04*
U.S. Cl. 261—77 **11 Claims**



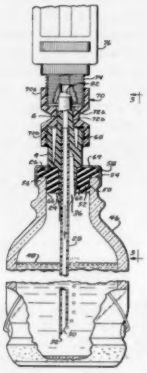
1. In an apparatus for aerating a liquid in a treatment pond comprising, a submerged vertically positioned open ended elongated tube, said tube having a plurality of smooth openings in the wall thereof and spaced along the extent of the wall intermediate the ends thereof, said openings providing for liquid communication between the interior of said tube and the main body of liquid in the pond; a helical baffle positioned longitudinally in the interior of said tube to provide at least two tortuous passages therein with said openings in said wall of the tube being positioned to provide communication between the exterior of the tube and each of said passages; and a gas bubble generator disposed beneath the lower end of said tube and adapted to be anchored with said tube on the bottom of said pond, said generator discharging bubbles into the liquid of said pond and being constructed and arranged to discharge streams of bubbles in generally opposed directions so as to produce a shearing action therebetween as the bubbles engage one another and to produce an upward flow of liquid and bubbles through the interior of said tube and into the tortuous passages of the baffle therein, said upward flow of liquid and bubbles inducing additional flow of liquid from the pond through the openings in the wall of said tube.

3,852,385

GAS HUMIDIFICATION APPARATUS

James A. Huggins, Libertyville, Ill., assignor to Med-Pak Corporation, Charlestown, W. Va.

Filed Dec. 6, 1972, Ser. No. 312,670
Int. Cl. B01f *3/04*; A61m *15/00*
U.S. Cl. 261—121 R **3 Claims**



1. A connector assembly for use in a gas humidification system that includes a container with liquid and an opening with a closure therein, said connector comprising a body having first tubular means for receiving gas from a gas supply, a threaded coupling cooperable with said body for connecting said first tubular means to the gas supply, second tubular means, third tubular means telescoped within said second tubular means and being in communication with said first tubular means, said third tubular means having a sharp pointed end for piercing a hole in the closure, an end portion of said second tubular means being cross-sectionally larger than said third tubular means and shaped to enlarge the hole pierced by said pointed end, said end portion of said second tubular means being barbed to prevent accidental withdrawal of said connector assembly from the closure and to permit the container to be suspended from said connector assembly, said third tubular means and said second tubular means defining a chamber that is part of the bore of said second tubular means, a part of said third tubular means that includes said pointed end extending beyond end portion of said second tubular means for immersion in the liquid of the container such that gas will flow from said first tubular means through said third tubular means into the liquid to humidify the gas and the humidified gas will then flow from the surface of the liquid into said chamber, and means forming a conduit for conveying said humidified gas from said chamber, said conduit projecting laterally from said second tubular means and having a decreasing external diameter in a direction away from said second tubular means for telescopically receiving a nasal cannula.

3,852,386

MANUFACTURE OF FILM HAVING FORMED FASTENER MEANS THEREIN

Raymond D. Behr, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 99,782, Dec. 21, 1970, abandoned. This application Jan. 3, 1972, Ser. No. 214,835
Int. Cl. B29d *7/22*, *23/04*
U.S. Cl. 264—40 **4 Claims**

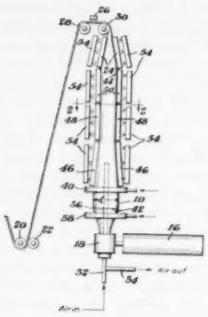
1. In a method of manufacturing film, the steps of:

a. continuously extruding a seamless tube of film while providing pressure internally to the tube, and then col-

lapsing the moving tube at an area remote from the point of extrusion,

b. integrally extruding with the tube, a first thickened profile defining a continuous gap the width of which is sensitive to hoop tension in the tube during a period of its manufacture, and at least a second thickened profile spaced circumferentially from the gap defining profile and adapted to be interlockingly receivable in said gap by means of cooperative sizing and configuration between the profiles, said profiles extending continuously in the direction of extrusion along the inner surface of the tube,

c. clasping the tube between opposed racks of heat conductive roller means for a substantial extent of the area



betweent the film frost line and the frost line of the profiles, said roller means rotatably engaging opposite sides of the moving tube, and externally contacting the area comprising the base of the gap defining profile at a time in the process when the ultimate gap width is sensitive to hoop tension, and

d. cooperatively with step (c), cooling the rotating roller means to withdraw heat from said base area, said heat withdrawal step being practiced at a rate to control the width of the gap defining profile with respect to the size of the profile receivable therein, to thereby establish a proper interlocking relationship between said profiles.

3,852,387

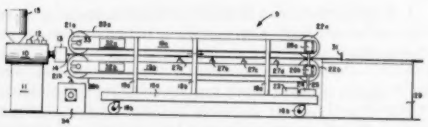
DOUBLE BELT PLASTIC SHEET FORMING AND TAKE-FF METHOD

Newman M. Bortnick, 509 Oreland Mill Rd., Oreland, Pa. 19075; James W. White, 3308 Christmas Ave., Tuscon, Ariz. 185716, and Eddy A. Hazbun, 3 Valley Dr., Leven Rd., Yarm, England

Continuation-in-part of Ser. No. 31,704, April 24, 1970, abandoned. This application Aug. 10, 1972, Ser. No. 279,573

Int. Cl. B29d *7/14, 7/22*

U.S. Cl. 264—40 **9 Claims**



1. The method of producing plastic sheets having desirable surface characteristics, superior dimensional stability, and which approach isotropic properties, comprising the steps of:

a1. extruding through an adaptor a viscous, unplasticized thermoplastic polymer at low pressure in a temperature range above the glass transition temperature but below the degradation temperature of said polymer wherein a rope-like strand is continuously formed at a volumetric flow rate wherein said thermoplastic polymer is selected from the group consisting of:

poly(methyl methacrylate), copolymers of methyl methacrylate with up to 50 percent of lower alkyl acrylates, lower alkyl methacrylates, isobornyl methacrylate, styrene, and acrylonitrile; blends of said polymethacrylate homo and copolymers with multi-staged acrylic rubber impact modifiers; polyvinyl chloride; copolymers of vinyl chloride with up to 10 percent of such monomers as vinyl pivalate, vinyl acetate, ethylene and propylene; blends of vinyl chloride homo and copolymers with multistaged acrylic and butadiene rubbers, and with polymethacrylate homo and copolymers; acrylonitrile/butadiene/styrene and α-methylstyrene plastics; acrylonitrile/styrene/acrylate plastics; methyl methacrylate/acrylonitrile/-butadiene/styrene plastics; methyl methacrylate/ butadiene/styrene plastics; impact polystyrene blends; polyphenylene oxide; blend of poly(phenylene oxide) and polystyrene, impact polystyrene and multistaged butadiene rubber impact modifiers; polycarbonates; polysulfones; and poly (2,2-bis(4-hydroxyphenyl) propane isophthalate);

a. promptly delivering at said temperature range said strand to take-up means comprising juxtaposed endless conveyor belts which are adapted to take up the same and adhering thereto;

b. compressing, spreading and flattening the continuous strand between said take-up means by adjustment of the linear take-off rtake-up speed of said take-up means in relation to said volumetric flow rate;

c. driving said belts synchronously;

d. adjustably heating said belts in the zone of their intake nip within a temperature gradient ranging from above the glass temperature of the thermoplastic material being processed but below the deterioration temperature thereof;

e. maintaining the belt tension to compensate for variations in the belt length attributable to variable heating thereof, whereby the belts run true;

f. cooling both of said belts to a temperature below the glass temperature of said sheet to further allowing parting of said formed sheets without adherence to either belt; and

g. taking off the resulting cooled polished polymer sheets from the discharge end of said belts.

3,852,388

PREPARATION OF ASYMMETRIC POLYMER MEMBRANES

Shiro G. Kimura, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 158,979, July 1, 1971, Pat. No. 3,762,136, which is a division of Ser. No. 36,923, May 13, 1970, Pat. No. 3,709,774. This application Apr. 19, 1973, Ser. No. 352,428

Int. Cl. B29d *27/04;* **B01d** *39/16*

U.S. Cl. 264—41 **2 Claims**

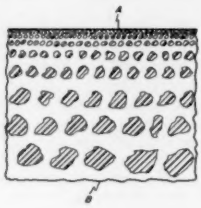
1. A method for the preparation of asymmetric polymer membranes comprising the steps of:

a. dissolving at least about 5 percent by weight of polyarylene oxide in a solvent system, said solvent system consisting of chloroform and dichlorobenzene,

b. casting a layer of the polyarylene oxide solution so formed on a flat clean surface in a thickness ranging from about 5 to 25 mils, whereby a single major surface is exposed,

c. permitting desolvation to occur for less than 1 minute,

d. immersing said layer in methanol,
e. removing the asymmetric polyarylene oxide membrane so



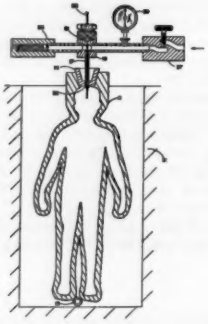
produced having a non-porous skin and
f. drying said polyarylene oxide membrane.

3,852,389

METHOD OF MAKING FOAM PLASTIC BODIES HAVING LIFELIKE OUTER SKINS

Seymour Adler; Fleet E. Nuttall, both of Los Angeles, and Wallace H. Shapero, Torrance, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Division of Ser. No. 792,921, Jan. 22, 1969, abandoned. This application Dec. 7, 1970, Ser. No. 95,596
Int. Cl. B29d *27/04*
U.S. Cl. 264—46.4 **4 Claims**



1. A method of making foamed plastic bodies having an outer skin fused thereto comprising:
providing a suitable mold having the desired size and shape of said body,
coating all of the inner walls of said mold with a first plastisol composition, said composition including a blowing agent, and suitable activator capable of causing a small amount of gas to be released in said composition,
heating said mold after said first plastisol is coated thereon to gel a layer of said plastisol without releasing any blowing agent,
depositing a second plastisol on the heated surface of said first plastisol before activation of the activator in said first plastisol composition whereby the residual heat gels a layer of said second plastisol without releasing any blowing agent therein; said second composition including a blowing agent and suitable activator capable of causing a larger amount of blowing agent to be released in said second plastisol than said first plastisol, and then simultaneously heating both said first and second plastisols for a sufficient period of time to cause a small amount of gas to be released in said first plastisol and a larger amount of gas to be released in said second plastisol.

3,852,390

METHOD FOR FILLING THIN WALL CUP CAVITIES WITH PLASTIC BEADS

James M. Harrison, Forth Worth, Tex., assignor to Crest Container Corporation, Fort Worth, Tex.

Continuation-in-part of Ser. No. 126,628, March 22, 1971, abandoned. This application Aug. 25, 1972, Ser. No. 283,936
Int. Cl. B29d *27/00*
U.S. Cl. 264—53 **3 Claims**

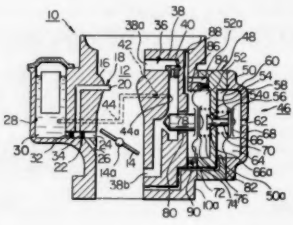
1. In a method of filling a thin wall cup mold cavity having a spacing of from 0.030 to 0.100 inches with lightweight foam polystyrene beads impregnated with an expanding agent in which a thin wall cup mold is defined by two parts, a generally tapered core element and a correspondingly tapered cavity element, with an inlet port in the center of the cavity element in the middle of what will be the bottom of the cup and an annular outlet at what will be the lip of the cup around the periphery thereof, with an airstream through the mold cavity entering at the inlet opening in the center of the cavity element and leading through the annular outlet at what will be the lip of the cup to convey the beads into the mold cavity and an offset annulus at the small end of the core element so that the resulting cup will have an internal stacking annulus in the bottom of the cup, the improvement comprising the step of off-setting the airstream inwardly laterally opposite the offset annulus in the core element at a point between the offset annulus and the end of the core element such that the side wall of the cavity at what will be the bottom of the cup will be fully filled with beads during molding.

3,852,391

CARBURETOR WITH DECELERATION CIRCUIT

Takashi Hisatomi, and Kenichi Sasaki, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Mar. 10, 1972, Ser. No. 233,602
Claims priority, application Japan, Mar. 11, 1971, 46-13272
Int. Cl. F02m *7/12*
U.S. Cl. 261—69 R **1 Claim**



1. A carburetor for an internal combustion engine comprising a carburetor body, a carburetor induction passage formed in said carburetor body, a venturi in said carburetor induction passage, a throttle valve operatively disposed in said carburetor induction passage, a main mixture circuit opening into said venturi in said carburetor induction passage for supplying an air-fuel mixture to said carburetor induction passage for high-speed and acceleration operations of said engine, an idling and slow-running mixture circuit opening into said carburetor induction passage downstream of said throttle valve for supplying an air-fuel mixture to said carburetor induction passage for low-speed and deceleration operations of said engine, a float chamber which supplies fuel to said two circuits, a by-

pass passage having an inlet port communicating with said carburetor induction passage upstream of said venturi and an outlet port comunicating with said carburetor induction passage downstream of said throttle valve, an air jet provided in said by-pass passage to control the flow rate of air passing therethrough, a fuel jet provided in a fuel supply by-pass passage opening to the first mentioned by-pass passage downstream of said air jet and leading directly from said float chamber, and a control unit for controlling the flow of air-fuel mixture passing through the first mentioned by-pass passage in response to the vacuum prevailing in said carburetor induction passage downstream of said throttle valve, said control unit including a housing having first and second vacuum chambers and a spring seat intervening therebetween said spring seat having formed therin a central aperture, said second vacuum chamber provided with a port communicating with said carburetor induction passage upstream of said venturi through a calibrated air bleed, a passage having one end communicating with said carburetor induction passage downstream of said throttle valve and the other end communicating with said first vacuum chamber, a cap member attached to one end of said housing and having an opening vented to the atmosphere, a first diaphragm member interposed between said one end of said housing and said cap member, a first atmosphere chamber formed between said first diaphragm member and the inner surface of said cap member, a control valve element connected to said first diaphragm member and extending through said central aperture formed in said spring seat to control communication between said first and second vacuum chambers, a first compression spring disposed in said first vacuum chamber for biasing said first diaphragm member in a direction to cause said control valve element to close said central aperture of said spring seat for thereby interrupting communication between said first and second vacuum chambers, a second diaphragm member interposed between the other end of said housing and said carburetor body, a second atmospheric chamber defined in a cavity formed in said carburetor body and said second diaphragm member, said second atmospheric chamber communicating with said carburetor induction passage upstream of said venturi, means defining an orifice between said second atmospheric chamber and said passage having one end communicating with said induction passage downstream of said throttle valve, an adjusting valve element connected to said second diaphragm member and extending through an opening formed in said carburetor body into said by-pass passage to open and close said by-pass passage, and a second compression spring disposed in said second vacuum chamber for biasing said second diaphragm member in a direction to cause said adjusting valve element to close said by-pass passage, said first vacuum chamber being subjected to the vacuum prevailing in said carburetor induction passage downstream of said throttle valve, whereby when the vacuum in said first vacuum chamber exceeds a predetermined value during deceleration operation of said engine, said first diaphragm member is moved against the force of said first compression spring in a direction to cause said control valve element to open said central aperture formed in said spring seat for interconnecting said first vacuum chamber with said second vacuum chamber to permit the vacuum to act on and cause said second diaphragm member to move against the force of said second compression spring in a direction to cause said adjusting valve element to open said by-pass passage.

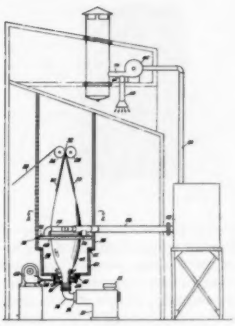
3,852,392

METHOD OF REMOVING PLASTICIZER MIST FROM AIR

Willard Parker Davis, Tewksbury; Jerold Julius Golner, Lowell, and Sumner Shelton Feinstein, Peabody, all of Mass., assignors to Borden, Inc., Columbus, Ohio

Filed Dec. 18, 1972, Ser. No. 316,345
Int. Cl. B29d *7/00*
U.S. Cl. 264—89 **5 Claims**

1. In a blown tube method for making plasticized polyvinyl chloride film wherein molten plasticized thermoplastic is extruded in the form of a seamless tubing with the tubing being flattened at a point spaced from the point of extrusion and inflated to a predetermined diameter intermediate the point of extrusion and the point of the tubing where plasticizer mist is no longer released in any substantial quantity from the surface of the film; the exterior surface of tubing being wholly enveloped in the vicinity of the point of extrusion with a cooling medium of chilled gas, the chilled gas circulated through the enclosure such that the chilled gas wholly envelopes the exterior surface of the molten plastic being extruded to cool the plastic to its solidification point and to pick up



plasticizer mist being generated, the cooling gas containing plasticizer mist passed to a mist removal device, the mist removed and the cooling gas discharged from the mist removal device to the atmosphere outside of the enclosure, wherein the improvement comprises adjusting an iris diaphragm opening surrounding the inflated extruded seamless tubing at a point of the tubing where plasticizer mist is no longer released in any substantial quantity from the surface of the film to provide an opening from ¼ to 3 inches between the inner edge of the iris diaphragm and the outer edge of the tubing passing through the iris diaphragm.

3,852,393

RESINOUS COMPOSITION COMPRISING A BLEND OF AN ABS RESIN AND POLYCARBONATE RESIN

Shogi Furukawa; Yuzo Sonoyama, and Akira Ohi, all of Osaka, Japan, assignors to Daicel Ltd., Higashi-ku, Osaka, Japan

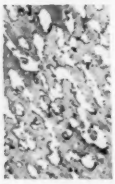
Filed Oct. 5, 1972, Ser. No. 295,118
Claims priority, application Japan, Oct. 6, 1971, 46-78562
Int. Cl. C08g *39/10*
U.S. Cl. 260—873 **15 Claims**

1. A blended resinous composition, in which the resin constituents of said composition consist essentially of (1) from 30 to 75 percent by weight of a graft copolymer prepared by bulk suspension polymerization of polybutadiene or a copolymer comprising butadiene, as the rubber component, and a vinyl cyano compound and a vinyl aromatic compound as the monomer component, and (2) the balance of said resin constituents is a polycarbonate of a di-(monohydroxyphenyl)-substituted aliphatic hydrocarbon.

3,852,394
THERMOPLASTIC POLYCARBONATE/POLYBUTADIENE-METHACRYLATE-STYRENE GRAFT POLYMER/STYRENE-ACRYLONITRILE COPOLYMER BLENDS

Hiroaki Kubota; Yoshithugu Nakamura, and Ryoichi Hasegawa, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 27, 1972, Ser. No. 318,703
Claims priority, application Japan, Dec. 29, 1971, 46-2837
Int. Cl. C08g 39/10, 51/58
U.S. Cl. 260—873 2 Claims



1. A thermoplastic composition (D) comprising

A. a resin obtained by graft polymerizing 90 – 10 parts by weight of a monomeric mixture consisting of 90 – 10 percent by weight of a monomeric methacrylic acid ester and 10 – 90 percent by weight of an aromatic vinyl monomer, in the presence of 10 – 90 parts by weight of a polybutadiene of butadiene-styrene copolymer containing at least 50 percent by weight of butadiene unit;

B. a thermoplastic resin obtained by copolymerizing an aromatic vinyl monomer with 15 – 70 percent by weight of said aromatic monomer of a vinyl cyanide monomer; and

C. a polycarbonate resin derived from a (4,4′ - dihydroxy diphenyl) alkane by the ester exchange or phosgene method;

with the provision that the ratio of the total amount contained of the resin (A) and the thermoplastic resin (B) to resin (C) is in the range of 70:30 – 10:90, and that polybutadiene or the butadiene copolymer component containing at least 50 percent by weight of butadiene unit is contained in an amount of 5 – 50 percent by weight of the total amount contained of the resin (A) and the thermoplastic resin (B).

3,852,395
TRIS-(3,5-DI-T-BUTYL-4-HYDROXYPHENYLTHIO) PHOSPHINE

Tamotsu Fujisawa, Yamato, and Michio Aiba, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed July 31, 1973, Ser. No. 384,386
Claims priority, application Japan, Aug. 3, 1972, 47-77288
Int. Cl. C07f 9/18
U.S. Cl. 260—953 1 Claim

1. Tris-(3,5-di-t-butyl-4-hydroxyphenylthio)phosphine.

3,852,396
2-CHLOROVINYL ETHYL ISOPROPYL PHOSPHORAMIDATE AND 2-CHLOROVINYL ETHYL DIETHYL PHOSPHORAMIDATE

Donald D. Phillips, Westfield, N.J., and Loyal F. Ward, Jr., deceased, late of San Jose, Calif. (by Melba L. Ward, executrix), assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 5, 1973, Ser. No. 329,910
Int. Cl. C07f 9/22; A01n 9/36
U.S. Cl. 260—957 2 Claims

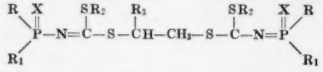
1. 2-Chlorovinyl ethyl isopropylphosphoramidate.
2. 2-Chlorovinyl ethyl diethylphosphoramidate.

3,852,397
PROCESS FOR THE SYNTHESIS OF BIS-N-PHOSPHORYLATED COMPOUNDS

Roger Vernon Kendall, Cranbury, N.J., assignor to American Cyanamid Company, Stamford, Maine

Filed Feb. 22, 1973, Ser. No. 334,540
Int. Cl. C07f 9/40
U.S. Cl. 260—968 7 Claims

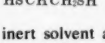
1. A process for the preparation of bis-N-phosphorylated compounds of the formula:



wherein R and R_1 is alkyl (C_1–C_4), alkoxy (C_1–C_4) or phenyl; X is sulfur or oxygen; R_2 is alkyl (C_1–C_4), alkenyl (C_1–C_4), benzyl or halo-substituted benzyl; and R_3 is hydrogen or alkyl (C_1–C_4), said process comprising the steps of:

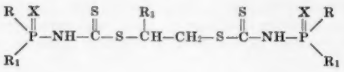
1. reacting a thiocyanate of the structure

with a dithiol of the structure

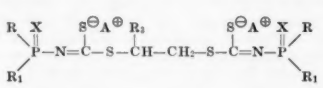


in the presence of an inert solvent and acid acceptor at a temperature between 0° and 40°C.;

2. treating the thus-formed reaction mixture with ethyl ether followed by acidification with a mineral acid thereby obtaining the product of the structure



3. reacting the thus-formed product with an alkali metal alkoxide (C_1–C_4) in the presence of an aprotic solvent;
4. separating from the thus-formed reaction mixture a dialkali salt free of any excess base of the formula



and

5. treating said dialkali salt in an aprotic solvent at a temperature of 0° to 50°C. with an excess of alkylating agent of the formula

$$R_2Z$$

wherein A is the alkali metal; and Z is iodine or bromine.

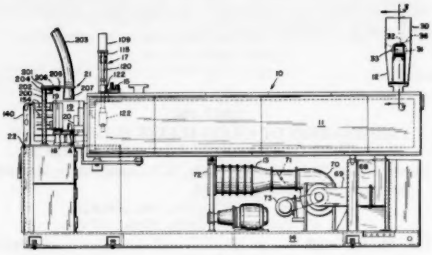
3,852,398
METHOD FOR HEATING TRANSFERRING AND BLOW MOLDING TUBULAR PARISONS

Lawrence A. Moore, B-B 16 Valley View, King of Prussia, Pa. 19406

Division of Ser. No. 3,003, Jan. 15, 1970, abandoned. This application Mar. 7, 1972, Ser. No. 232,645
Int. Cl. B29c 17/07
U.S. Cl. 264—94 11 Claims

1. A method for converting a tubular parison of thermoplastic material into a container comprising the steps of: heating the parison to a forming temperature in an oven, conveying

the heated parison to a mould station by grasping the heated parison with a transfer device and moving it vertically out of the oven and then horizontally to a mould station, and then at the mould station while the parison is still held by the transfer



device, stretching the parison axially thereof, closing the mould on the stretched parison, creating an outward pressure differential across the parison to shape the container against the mould and opening the mould.

3,852,399

PROCESS FOR THE PRODUCTION OF CARBON BLACK BEADS

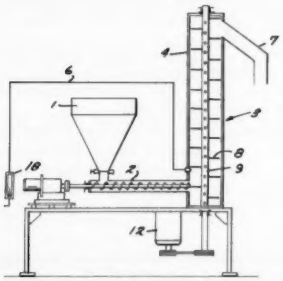
Lothar Rothbuhr, and Walter Fritz, both of Hermulheim, Germany, assignors to Deutsche Gold- und Silber- Scheideanstalt vormals Roessler, Frankfurt(Main), Germany

Filed Sept. 6, 1972, Ser. No. 286,749

Claims priority, application Germany, Sept. 23, 1971, 2147503

Int. Cl. B01j *2/10*

U.S. Cl. 264—117 **4 Claims**



1. In a process for wet pelletizing carbon black in a pelletizing apparatus comprising an elongated cylindrical housing having a longitudinal axis on which a centrally positioned pin shaft rotates, the improvement comprising:

a. introducing carbon black and a pelletizing liquid into a lower inlet of said pelletizer having said longitudinal axis substantially vertically positioned;

b. rotating said pin shaft to move said carbon black and liquid vertically upwardly through said pelletizer while forming carbon black pellets therein; and

c. removing from an upper exit of said pelletizer, carbon black pellets having a higher bulk density, increased strength, increased abrasion resistance and requiring less pelletizing liquid than when said carbon black and pelletizing liquid are so treated in a conventional horizontally positioned pelletizer.

3,852,400

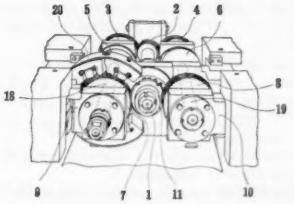
ROLLING METHOD FOR MANUFACTURING PLASTIC GEARS

Toshimasa Arai, Nagoya, Japan, assignor to President of Nagoya Institute of Technology, Kokichi Sano, Nagoya, Japan

Filed Mar. 12, 1973, Ser. No. 340,531

Int. Cl. B29c *17/00;* **B29d** *15/00*

U.S. Cl. 264—154 **13 Claims**



1. A method of making plastic gears from a thermoplastic gear blank comprising rough rolling said gear blank by pressing a hot instrument held at a temperature higher than the softening temperature of said plastic material into contact with said gear blank to form gear teeth in said gear blank, and subsequently finish rolling said gear blank by pressing a cold instrument held at a temperature lower than the temperature of said hot instrument into contact with said gear blank to solidify said plastic and finish form said gear teeth to desired dimensions with said cold instrument.

3,852,401

METHOD FOR PRODUCING ARTIFICIAL FIBERS CONTAINING MICROCAPSULES

Hiroshi Suzuki, and Tadashi Ichimaru, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed June 27, 1972, Ser. No. 266,744

Claims priority, application Japan, June 29, 1971, 46-47524

Int. Cl. D01f *7/00*

U.S. Cl. 264—182 **14 Claims**

1. In a method for producing artificial fibers containing microcapsules of a fiber modifier selected from the group consisting of sanitary processing agents, flame resistant agents, luminous substances, deodorants, softening agents, perfumes, antistatic agents, antioxidants and U.V. absorbers, by extruding a spinning solution containing the microcapsules in a finely dispersed state, a fiber forming polymer selected from the group consisting of polyamides, polyesters, polyvinyl chloride, polyvinyl alcohol, polyacrylonitrile, copolymers of acrylonitrile with one or more other vinyl monomers and cellulose acetate, and a solvent for the polymer, the improvement wherein the spinning solution containing the microcapsules is prepared by finely dispersing in the spinning solution the fiber modifier which is incompatible with the spinning solution and a film-forming substance soluble in the spinning solution or fiber modifier, and forming a film insoluble in the spinning solution on the surface of the dispersed particles of the fiber modifier to form microcapsules enclosing the fiber modifier therein.

3,852,402
PROCESS FOR THE PREPARATION OF POLYVINYL ALCOHOL FIBERS

Shoichi Tanaka, 550-1, Yasue; Susumu Kousaka, 1273-4, Nakasho, both of Kurashiki-City, and Toshio Kimura, 2-208, Katsuragi-Cho, Nara-City, all of Japan

Continuation-in-part of Ser. No. 90,816, Nov. 18, 1970, abandoned. This application Nov. 7, 1972, Ser. No. 304,576
Claims priority, application Japan, Nov. 25, 1969, 44-94790; Apr. 30, 1970, 45-37354
Int. Cl. D01f *7/00*
U.S. Cl. 264—185 **5 Claims**

1. Process for the preparation of polyvinyl alcohol fibers comprising:

i. spinning an aqueous polyvinyl alcohol solution comprising 10 to 30 percent by weight of a polyvinyl alcohol having a degree of polymerization ranging from 1,200 to 3,500 and 1 to 5 percent boric acid or a substantially water soluble borate salt thereof based on the weight of polyvinyl alcohol;

ii. coagulating the spun polyvinyl alcohol solution in an aqueous solution containing 10 to 100 gms/liter sodium or potassium hydroxide and 100 to 330 gms/liter sodium sulfate to obtain fibers;

iii. roller drawing said fibers;

iv. neutralizing alkali adhered to said fibers with acid;

v. wet-heat drawing said fibers;

vi. rinsing said fibers with water to adjust the amount of residual boric acid or borate salt to 0.2 to 0.9 percent by weight of polyvinyl alcohol;

vii. dehydrating and drying said fibers; and

viii. dry-heat drawing said fibers to a total drawing ratio of at least 1,300 percent, thereby obtaining polyvinyl alcohol fibers exhibiting the following high temperature properties:

Yarn tenacity at 120° c. — at least 7.5 gms/denier

Yarn initial modulus at 120° C. — at least 100 gms/denier

Yarn creep at 135° C. — less than 2 percent.

3,852,403
LEACHING URANIUM ORES FLUIDIZED WITH A POLYELECTROLYTE

Robert Ben Booth, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 58,338, July 27, 1970, Pat. No. 3,746,641, which is a continuation-in-part of Ser. No. 179,287, March 7, 1962, Pat. No. 3,524,682, which is a continuation-in-part of Ser. No. 698,429, Nov. 25, 1957, abandoned. This application Nov. 17, 1972, Ser. No. 307,666
Int. Cl. B01d *11/00;* **C01g** *43/00*
U.S. Cl. 423—18 **5 Claims**

1. In the leaching of uranium ore which includes the steps of grinding the ore to minus 48 mesh material, mixing with aqueous sulfuric acid containing about 60 grams of sulfuric acid per liter, to form a suspension in which the solids range from comparatively coarse, larger than 65 mesh, to very fine materials, smaller than 325 mesh, and which suspension has at least about 30 percent solids on a weight basis, and which suspension in the absence of a suspending agent, when in a quiescent state tends to separate with the formation of a solid unwieldy cake which stalls agitators and resists resuspension, and has about 4 pounds of sodium chlorate per ton of ore present, leaching at about 45° C., over a leaching cycle of about 48 hours, while continuously agitating the leaching suspension, the step which comprises: adding to said acidic suspension a small but effective amount of a suspending agent, from 0.005 to 5 pounds per ton of suspended solids of a water soluble polyelectrolyte which is an ampholytic linear carbon chain vinyl polymer consisting essentially of recurring carbamylethylene and carboxyethylene linkages, and not more than a minor amount of nitriloethylene linkages and salts thereof, having a weight average molecular weight in excess of 100,000, thereby producing a suspension which is of uniform characteristic and from which the solids drop out as an unclassified readily resuspendable material, said polymer increasing the viscosity of the aqueous phase, insuring laminar flow at higher velocities, thereby reducing pumping power requirements, and simultaneously stabilizing the suspension, so that during interruptions in agitation, the suspension remains fluidized, and in pumpable condition.

3,852,404
PREPARATION OF CRYSTALLINE SULFIDES AND SELENIDES OF CADMIUM ZINC AND MERCURY

James Ernest Daly, Hudson Falls, N.Y., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 24, 1972, Ser. No. 300,028
Int. Cl. C01g *9/08;* **C01b** *19/00, 17/00*
U.S. Cl. 423—99 **6 Claims**

1. A process for converting a crude, essentially amorphous precipitate of cadmium sulfide, or a mixture of cadmium sulfide and cadmium selenide, zinc sulfide or mercury sulfide into a pigment having an x-ray diffraction pattern characteristic of the hexagonal crystalline structure, which process comprises treating said crude, essentially amorphous precipitate with sufficient of an aqueous solution containing from about 5 percent to about 55 percent by weight of ammonium sulfide to provide a weight ratio of solution to precipitate of at least 2:1 and a weight ratio of ammonium sulfide to precipitate of 0.1:1 to 10:1 at a temperature from about 20° C. to about 275° C. for a period of time ranging from about 1 to about 6 days until said precipitate is converted to the well-ordered hexagonal crystalline state and recovering the crystalline pigment so produced.

3,852,405
LAMINAR HEAVY METAL ALUMINOSILICATES

William T. Granquist, Houston, Tex., assignor to N L Industries, Inc., New York, N.Y.

Filed Sept. 22, 1972, Ser. No. 291,252
Int. Cl. C01b *33/26, 33/28;* **B01j** *11/40*
U.S. Cl. 423—118 **15 Claims**

1. A laminar **2** : **1** layer-lattice aluminosilicate mineral possessing an inherent negative charge balanced by cations exterior to said lattice and corresponding to the following formula for a given embodiment:

$$[(G_{4-ew}{}^{3}\,Y_{3w}{}^{2})^{VI}\,(Q_{8-x}{}^{4}R_{x}{}^{3})^{IV}\,O_{20}\,(OH)_{4-f}F_{f}]\cdot[\,d\,C^{y}\,]$$

where

2	e	3
0.01	w	2
0.02	ew	4
0.05	x	2.0
f	4	

wherein said first bracket represents said layer-lattice unit cell formulation and said second bracket represents said charge balancing cations; and wherein

G is at least 0.8 mol fraction aluminum ion, the remainder consisting of trivalent metal cations having an ionic radius not to exceed 0.75 A;

Y is selected from the class consisting of divalent metallic ions having an ionic radius not to exceed 0.75 A and mixtures thereof;

Q is at least 0.95 mol fraction silicon ions, the remainder consisting of tetravalent ions having an ionic radius not to exceed 0.64 A;

R is selected from the group consisting of trivalent ions having an ionic radius not to exceed 0.64 A and mixtures thereof; and

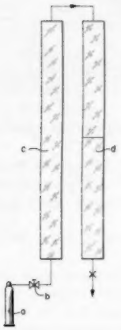
C is at least one charge-balancing catiion, with y being its valence and d being the number of such cations C where: $dy = x + 3\,(e-2)w$.

3,852,406

METHOD OF REMOVING OXYGEN FROM GASES

Hans Ludwig Krauss, and Hans Stach, both of Munich, Germany, assignors to Messer Griesheim GmbH, Frankfurt-/Main, Germany

Continuation of Ser. No. 737,425, June 17, 1968, abandoned. This application July 1, 1971, Ser. No. 159,049
Claims priority, application Germany, June 20, 1967, 62598
Int. Cl. B01d 53/34
U.S. Cl. 423—219 2 Claims



1. A method for removing oxygen by chemisorption from a gas selected from the group consisting of hydrocarbons, ethers, nitrogen, argon, neon, krypton, xenon, and carbon dioxide, said method comprising contacting said gas with an activated mass including an impregnated heat proof oxidic carrier, said carrier having a surface area of about 200 to about 500 m^2/gm, said impregnated carrier being obtained by impregnating said carrier with an aqueous solution of CrO_3 or a chromium salt to obtain an air-dry impregnated carrier having a chromium content by weight of about 1% to about 5%, said mass being activated by treatment with oxygen at a temperature from about 300°C to about 600°C for a period of time of about 30 minutes to about 240 minutes and subsequently being reduced with carbon monoxide or hydrogen at a temperature in the range of about 250°C to about 400°C but at a temperature below said activating temperature for a period of time of about 5 minutes to about 60 minutes whereby the chromium in said impregnated carrier is changed from 6-value chromium to bivalent chromium.

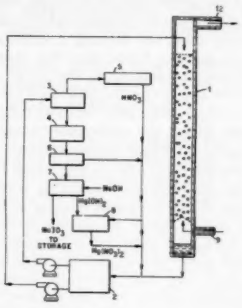
3,852,407

METHOD FOR REMOVING ALKYL IODIDES FROM AIR BY MERCURIC NITRATE SOLUTION

John M. Schmitt; David J. Crouse, Jr., and William B. Howerton, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Aug. 8, 1972, Ser. No. 278,842
Int. Cl. C01b 11/72, 11/12; C01g 13/04
U.S. Cl. 423—240 9 Claims

1. A method for removing alkyl iodides from an air stream comprising the steps of contacting said air stream with an aqueous solution of nitric acid at a concentration of from 6 to 14 molar containing mercuric nitrate at a concentration of at least 0.1 molar, at a temperature of from 25° to 80°C, thus



sorbing said iodides from said air stream into said solution and removing the sorbed iodine from said solution.

3,852,408

PROCESS FOR THE REMOVAL OF SULFUR DIOXIDE FROM CARRIER GASES

Thomas K. Ewan, Daingerfield; Orvis L. Holland, Linden; Willis Leon Martin, Longview, and James E. Hurse, Mt. Pleasant, all of Tex., assignors to Lone Star Steel Company, Dallas, Tex.

Filed Sept. 21, 1972, Ser. No. 291,007
Int. Cl. C01b 17/00
U.S. Cl. 423—242 26 Claims

1. A process for the removal of gaseous sulfur dioxide from a carrier gas comprising driving the carrier gas through an elongate mixing tube and forming a turbulent mixture of steam, atomized water and sulfur dioxide-containing carrier gas by directing water, heated to a temperature above its boiling point at atmospheric pressure and maintained under pressure sufficient to prevent boiling at that temperature, through a converging-diverging nozzle to form a jet of atomized water and steam directed into the mixing tube, introducing a fluid-contained alkaline reagent into the central portion of said turbulent mixture in said mixing tube by forming a series of intense jets of said fluid-contained alkaline reagent disposed circumferentially about the jet of atomized water and steam emerging from said nozzle and injecting said intense jets generally in the direction of movement of and into the jet of atomized water and steam emerging from said nozzle, further mixing the alkaline reagent and the sulfur dioxide-containing carrier gas by the continued expansion of the utilized water within the mixing tube, and so regulating the flow of said turbulent mixture through said mixing tube as to provide retention time of said turbulent mixture in said mixing tube sufficient for reaction of sulfur dioxide in said carrier gas with the alkaline reagent to form aqueous droplets of sulfur-containing reaction products and for growth in size of said aqueous droplets, and thereafter separating said aqueous droplets thus grown in size from the remainder of said carrier gas.

3,852,409

PROCESS FOR THE REMOVAL OF PARTICULATE MATTER AND ACIDIC GASES FROM CARRIER GASES

Willis Leon Martin, Longview; Orvis L. Holland, Linden; Thomas K. Ewan, Daingerfield, and James E. Hurse, Mt. Pleasant, all of Tex., assignors to Lone Star Steel Company, Dallas, Tex.

Filed Oct. 31, 1972, Ser. No. 302,608
Int. Cl. C01b 17/00
U.S. Cl. 423—242 28 Claims

1. A process for the removal of particulate matter from a carrier gas comprising driving the carrier gas through an elon-

gate mixing tube and forming a turbulent mixture of steam, atomized water and particulate-containing carrier gas in said mixing tube by (a) continuously supplying pressurized steam to the inlet of the nozzle of a steam ejector and expanding said steam through said nozzle to form a jet of said steam directed into the mixing tube, (b) forming a series of jet sprays of relatively cold aqueous liquid in a first atomized condition disposed circumferentially about the jet of steam emerging from said nozzle and (c) further atomizing said aqueous liquid by directing said jet sprays into the outer regions of said jet of steam; further mixing the particulate-containing carrier gas with said further atomized aqueous liquid and said steam within the mixing tube, and so regulating the flow of said turbulent mixture through said mixing tube as to provide retention time of said turbulent mixture in said mixing tube sufficient for the formation of aqueous droplets and entrainment of said particulate matter in said droplets and for growth in size of said particulate-containing aqueous droplets, and thereafter separating said particulate-containing aqueous droplets thus grown in size from the remainder of said carrier gas.

5. A process for the removal of particulate matter and gaseous sulfur dioxide from a carrier gas comprising driving the carrier gas through an elongate mixing tube and forming a turbulent mixture of steam, atomized water and carrier gas containing particulate matter and gaseous sulfur dioxide in said mixing tube by (a) continuously supplying pressurized steam to the inlet of the nozzle of a steam ejector and expanding said steam through said nozzle to form a jet of said steam directed into the mixing tube, (b) forming a series of jet sprays of relatively cold aqueous liquid containing an alkaline reagent in a first atomized condition disposed circumferentially about the jet of steam emerging from said nozzle and (c) further atomizing said aqueous liquid containing said alkaline reagent by directing said jet sprays into the outer regions of said jet of steam; further mixing the carrier gas with said further atomized aqueous liquid and said steam within the mixing tube, and so regulating the flow of said turbulent mixture through said mixing tube as to provide retention time of said turbulent mixture in said mixing tube sufficient for reaction of sulfur dioxide in said carrier gas with said alkaline reagent for the formation of aqueous droplets of sulfur-containing reaction products and entrainment of said particulate matter in said droplets and for growth in size of said droplets, and thereafter separating said droplets thus grown in size from the remainder of said carrier gas.

3,852,410

SULFUR DIOXIDE AND PARTICULATE CONTAMINANT REMOVAL FROM INDUSTRIAL STACK GASES

Richard D. Rivers; Mohiuddin Pasha; Jesse M. Goldsmith, and Robert T. Pring, both of Louisville, all of Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Dec. 7, 1972, Ser. No. 311,735

Int. Cl. B01j *9/04, 9/08, 9/12, 9/16, 9/20;* **C01b** *17/00*

U.S. Cl. 423—244 **10 Claims**

1. A method for removal of sulfur dioxide and particulate contaminants from industrial waste gases prior to their discharge into the atmosphere, said method utilizing sulfur dioxide reactants of suitable activity which are subsequently regenerated, said method further resulting in stable insoluble sulfur containing compounds to be discarded, said method comprising:

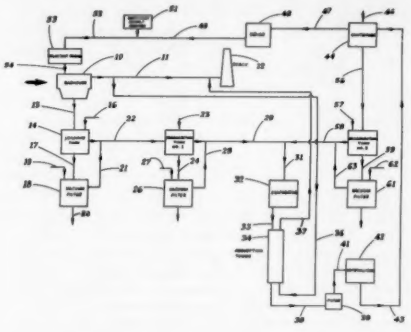
depositing soluble, alkaline sodium compounds onto filtering surfaces of a fabric tube type dust collector said finely divided alkaline sodium compounds being selected from the group of sodium carbonate, sodium bicarbonate, hydrated sodium carbonates, sodium sesquicarbonate, the naturally ocurring ores, nahcolite and trona, containing said alkaline sodium compounds, and combinations thereof;

passing waste gases comprising sulfur dioxide, carbon dioxide and particulate contaminants through said dust collector whereupon said particulate contaminants are restrained by said dust collector and whereupon a portion of said sulfur dioxide reacts with said soluble alkaline sodium compounds to form soluble reaction products;

periodically removing said soluble reaction products, unreacted soluble alkaline sodium compounds and particulate contaminants from said dust collector;

leaching said soluble reaction products and the unreacted portion of said soluble alkaline sodium compounds from said particulate contaminants into a leach liquor;

treating said leach liquor with calcium hydroxide to precipitate stable calcium salts, having anions including ele-



ments selected from the group sulfur and carbon, to be discarded leaving dissolved sodium compounds in said leach liquor;

reforming said soluble alkaline sodium compounds by reacting said dissolved sodium compounds with carbon dioxide;

converting the reformed soluble alkaline sodium compounds to solids; and,

redepositing said reformed soluble alkaline sodium compounds onto said filtering surfaces of said fabric-type dust collector for reaction with sulfur dioxide contained in waste gases.

3,852,411

METHODS FOR THE PREPARATION OF IMPROVED FAUJASITE COMPOSITIONS

Dale D. Maness, Austin, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 169,069, Aug. 4, 1971, Pat. No. 3,701,629. This application July 28, 1972, Ser. No. 275,908

Int. Cl. C01b *33/28, 33/26*

U.S. Cl. 423—329 **6 Claims**

1. A method for preparing a faujasite-type zeolite from clinoptilolite crystalline aluminosilicate zeolite which comprises preparing an aqueous reaction mixture containing said clinoptilolite crystalline aluminosilicate zeolite, alkali metal hydroxide and water such that the ratio of water/zeolite in said mixture will be from between about 0.3 g./g. to about 2.0 g./g. and the mole ratio of Na_2O/SiO_2 in said mixture will be from about 0.40 to about 0.50, maintaining said reaction mixture at a temperature in the range of from about 25° to 150°C. for an initial holding period of from 0.5 to 2.5 hours, acidifying and thereby reducing the Na_2O/SiO_2 mole ratio of said reaction mixture so that the Na_2O/SiO_2 mole ratio is within the range of from 0.30 to 0.45, maintaining said reaction mixture for a second holding period of from 8 to 40 hours, and recovering a crystallized product having a silica/alumina mole ratio greater than about 4.

3,852,412

NITRIC ACID RECOVERY SYSTEM

Walter Brenner, Teaneck, N.J., assignor to Brunswick Corporation, Skokie, Ill.

Filed Oct. 23, 1973, Ser. No. 408,324
Int. Cl. C01b 21/46
U.S. Cl. 423—390 4 Claims

1. A method for treating aqueous nitric acid solutions containing ferric nitrate to produce substantially pure nitric acid and ferric oxide wherein substantially no insoluble nitrogen oxide gases are evolved comprising:

a. adjusting the nitric acid concentration to the nitric acid-water azeotrope, and

b. distilling the solution under nitric acid azeotropic conditions.

3,852,413

LABELLED SULFATED AMYLOPECTINS AND METHOD OF DETERMINING ABNORMAL GASTROINTESTINAL MUCOSA

Peter S. Cammarata, Skokie, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 52,707, July 6, 1970, abandoned. This application July 3, 1972, Ser. No. 268,641
Claims priority, application Germany, July 2, 1971, 2133005
Int. Cl. A61k 27/04
U.S. Cl. 424—1 16 Claims

1. A composition comprising an alkali metal salt of sulfated potato starch amylopectin, which is characterized by a molecular weight of about $1–30 \times 10^7$ and a sulfate content of about 1–1.8 sulfate groups per glucose unit, chemically combined with a diagnostically effective, physiologically suitable labelling agent.

3,852,414

BONE SEEKING TECHNETIUM 99M STANNOUS PHOSPHATE COMPLEX

Norman Adler, Arlington, and Leopoldo Lazaro Gamin, Lexington, both of Mass., assignors to New England Nuclear Corporation, Boston, Mass.

Filed Sept. 13, 1972, Ser. No. 288,683
Int. Cl. A61k 27/04
U.S. Cl. 424—1 10 Claims

1. A metabolizable radioactive bone seeking composition for in vivo concentrating ^{99m}Tc in the skeletal structure of mammals comprising a technetium-99m-stannous-phosphate complex, at least 15 to 20% by weight of the phosphate moiety of which is a ring phosphate having the formula $P_nO_{3n}^{-n}$ and a molecular weight of less than 300, said phosphate moiety containing no more than 25% by weight of linear polyphosphates of formulation $P_nO_{3n+1}^{(n+2)}$ having a molecular weight greater than that of pyrophosphate.

3,852,415

COMPOSITIONS FOR USE IN RADIOIMMUNOASSAY AS A SUBSTITUTE FOR BLOOD PLASMA EXTRACT IN DETERMINATION OF CARCINOEMBRYONIC ANTIGEN

Jacques Pierre Vandervoorde, West Caldwell, N.J., assignor to Hoffman-La Roche, Inc., Nutley, N.J.

Filed Oct. 13, 1972, Ser. No. 297,565
Int. Cl. A61k 27/04
U.S. Cl. 424—1 7 Claims

1. A diluent composition suitable for forming an antibody to CEA titration curve or a CEA standard inhibition curve substantially identical to that resulting when blood plasma is used as the diluent, said composition having a pH 6.45–6.55 and comprising per liter; an amount of a salt of an organic carboxylic acid with an alkali metal which is equivalent to 1.3 grams of disodium ethylenediamine tetraacetic acid dihydrate, 0.17 grams of an antimicrobial preservative, 70 μl. of a 30 percent w/w aqueous solution of bovine serum albumin, sodium hydroxide, and sufficient water to make 1 liter.

3,852,416

TICK AND FLEA COLLAR OF SOLID SOLUTION PLASTICIZED VINYLIC RESIN-CARBAMATE INSECTICIDE

Larry M. Grubb, 3029 High Plateau, Garland, Tex. 75040, and James K. Baxter, 920 Waterview Cir., Richardson, Tex. 75080

Continuation of Ser. No. 147,664, May 27, 1971, abandoned. This application Jan. 22, 1973, Ser. No. 325,714
Int. Cl. A01k 27/00, 29/00
U.S. Cl. 424—14 13 Claims

1. In an animal collar having a buckle attached thereto, optionally punched with holes, for the control fleas and ticks on cats and dogs, the improvement consisting of a solid pesticidal composition, in the form of an elongated band suitable for forming said animal collar for the control of fleas and ticks on cats and dogs, which consists essentially of 5 to 15 percent of a carbamate selected from 1-naphthyl N-methyl carbamate and 2-isopropoxyphenyl N-methyl carbamate; 40 to 70 percent of a solid thermoplastic vinylic resin; and from 10 to 50 percent plasticizer selected from the phthalic esters, adipic esters and phosphoric esters, said percentages, by weight of the total composition, said composition characterized by being essentially dry and the property of providing a self-replenishing coating of particles of the carbamate on the surface of the composition by migration of the carbamate from the body of the composition, said migration occuring whenever carbamate particles are displaced from the surface of the composition.

3,852,417

SHAVING CREAM COMPOSITION

James H. McLaughlin, Ridgefield, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Filed May 2, 1973, Ser. No. 356,614
Int. Cl. A61k 7/14
U.S. Cl. 424—47 8 Claims

1. A foaming shaving cream composition packaged in a pressure container having a dispensing valve, said composition consisting essentially of 4 to 15 percent by weight of a mixture of water-soluble potassium and sodium stearates wherein the weight ratio of potassium stearate to sodium stearate is in the range of 2:1 to 7:1; 0 to 5 percent by weight of a water-soluble soap selected from the group consisting of sodium, potassium and triethanol ammonium cocoates and mixtures thereof; about 12 to 25 percent by weight of a liquid, water-immiscible oily material having skin lubricating or emollient properties and being selected from the group consisting of mineral oil having a Saybolt viscosity of 75 to 100 seconds at 100°F., cod liver oil, vegetable oils, alkyl esters of $C_{12}–C_{18}$ fatty acids and mixtures thereof; about 1 to 5 percent by weight of a $C_{10}–C_{16}$ fatty acid monoethanolamide or diethanolamide as a supplemental emollient, the weight ratio of said oily material to alkylolamide being in the range of about 5:1 to 25:1; 0 to 8 percent by weight of a humectant selected from the group consisting of glycerine and propylene glycol; about 40 to 78 percent by weight of water; and about 5 to 15 percent by weight of a liquefied, normally gaseous chlorofluorinated $C_1–C_2$ hydrocarbon propellant, said propellant being effective to provide a pressure in the range of about 30 to 70 p.s.i.g. at 70°F.

3,852,418

EMBALMANT

Eli Jordan Tucker, Jr., Memorial Professional Bldg., Suite 1007, Houston, Tex. 77002

Continuation-in-part of Ser. No. 532,011, Nov. 30, 1965, abandoned, and a continuation-in-part of Ser. No. 797,681, Feb. 7, 1969, abandoned. This application Oct. 18, 1971, Ser. No. 190,122
Int. Cl. A10n 1/00
U.S. Cl. 424—75 4 Claims

1. An embalmant composition for intravenous injection consisting essentially of hematoxylin and dimethyl sulfoxide in a ratio of 1.75 to 5.5 cc of dimethyl sulfoxide per gram of hematoxylin.

3,852,419

TRANS-8-TRANS-10-DODECADIEN-1-OL AS AN ATTRACTANT

Wendell Roelofs, 652 W. North St., Geneva, N.Y. 14456; Andre Comeau, 1082 Principal, Richmond, Quebec, Canada, and Ada Hill, 575 White Springs Rd., Geneva, N.Y. 14456

Division of Ser. No. 136,692, April 23, 1971, abandoned. This application Nov. 13, 1972, Ser. No. 306,233

Int. Cl. A01n *17/14*

U.S. Cl. 424—84 2 Claims

1. A method of attracting and trapping males of the species Laspeyresia pomonella, which comprises charging an insect trap with from about 1 to about 10,000 μg per trap of trans-8-trans-11-dodecadien-1-ol, and placing said trap in an area infested with *Laspeyresia pomonella*.

3,852,420

EQUINE STRANGLES VACCINE AND METHOD OF PREPARING AND USING THE SAME

Myron G. Usdin, Kansas City, Mo., assignor to Richardson-Merrell Inc., New York, N.Y.

Division of Ser. No. 108,147, Jan. 20, 1971, abandoned. This application Aug. 24, 1973, Ser. No. 391,228

Int. Cl. A61k *23/00*

U.S. Cl. 424—92 3 Claims

1. A vaccine effective in protecting equines against infection by virulent strains of *Streptococcus equi* which consists essentially of an immunizing dosage, in an injectable vehicle, or adjuct, of a proteinaceous antigen, which is not the capsule, extracted from the cell surface of *Streptococcus equi* bacterial cells, said vaccine being free of insoluble cellular material and being prepared by culturing virulent *Streptococcus equi* bacteria under aerobic conditions in a culture medium producing minimum concentration proteinase under temperature (about 37°C) and pH (about 7.8 to 6.3) conditions inhibiting formation of proteinase, until large capsules surrounding *Streptococcus equi* cells are present, separating the bacterial cells from their culture medium after about 4 to 20 hours growth, extracting from the cell surface of the bacteria a proteinase-sensitive proteinaceous antigen which is not the capsule and which is effective against *Streptococcus equi*, by heating the bacterial cells to extract the proteinaceous antigen from the cells, adjusting the hydrogen ion concentration of the solution to above 7.0 to separate the spent cells from the extracted antigen, removing the insoluble material and adjusting the pH to below 7.0.

3,852,421

EXCIPIENT AND SHAPED MEDICAMENTS PREPARED THEREWITH

Shunichi Koyanagi; Kinya Ogawa; Yoshiro Onda, all of Niigata-ken, and Akira Yamamoto, Naoetsu, all of Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Continuation-in-part of Ser. No. 80,203, Oct. 12, 1970, abandoned. This application Sept. 20, 1971, Ser. No. 182,226

Claims priority, application Japan, Mar. 23, 1970, 45-24203

Int. Cl. A61j *3/10*

U.S. Cl. 424—94 7 Claims

1. A medicament solid dosage form comprising a medicament and 1 to 50% by weight, based on the weight of the medicament solid dosage form, of a cellulose ether excipient selected from the group consisting of hydroxy alkylcellulose and hydroxyalkyl-alkylcellulose, in which the average total number of substituted moles of hydroxyalkyl groups and alkyl groups per anhydrous glucose unit is 0.1 to 1.30, the average number of substituted moles of hydroxyalkyl group per anhydrous glucose unit is 0.05 to 1.00, and the average number of substituted moles of alkyl groups per anhydrous glucose unit is 0 to 1.00.

3,852,422

LONG-ACTIVE GONADOTROPINS

Pietro Donini, Rome, Italy, assignor to Istituto Farmacologico Serono S.p.A., Rome, Italy

Filed Nov. 30, 1971, Ser. No. 203,486

Claims priority, application Italy, June 26, 1971, 26333/71; July 30, 1971, 52011/71

Int. Cl. A61k *17/00, 17/06*

U.S. Cl. 424—100 10 Claims

1. An injectable pharmaceutical preparation suitable for treating disorders of the functions of the genitals comprising a suspension having pH 7.1–7.4 and containing a gonadotropin selected from the group consisting of human menopausal gonadotropin, human chorionic gonadotropin, human pituitary gonadotropin, pregnant mare serum, and mixtures thereof, 4–12 weight percent of said gonadotropin being in the form of soluble hormone in the supernatent and the remainder being in the form of a precipitation product of said gonadotropin and an inorganic precipitation component selected from the group consisting of zinc hydroxide in an amount corresponding to 0.4–0.7 mg Zn per mg gonadotropin and aluminum hydroxide in an amount corresponding to 0.9–1.4 mg Al per mg gonadotropin.

3,852,423

INTERFERON INDUCER AND PROCESS FOR PREPARING THE SAME

Yasukiyo Nakase, Yokohama, and Yasuhiko Kojima, Musashino, both of Japan, assignors to The Kitasato Institute, Tokyo, Japan

Filed Mar. 21, 1972, Ser. No. 236,670

Claims priority, application Japan, Mar. 22, 1971, 46-15825

Int. Cl. C12d *13/00*

U.S. Cl. 424—115 4 Claims

1. A process for the preparation of an interferon inducer for viral infections which comprises culturing phase II or III Bordetella pertusis in a liquid culture medium, separating a supernatant liquid from the cultured medium, filtering the thus obtained supernatant under sterile condition to obtain a filtrate, extracting the thus obtained filtrate by ultra filtration or chromatography to obtain the effective fraction, said effective fraction being capable of providing an interferon inducing effect.

3,852,424

PURIFIED FERRIMYCIN AND PROCESS FOR OBTAINING SAME

Ernst Gaeumann, deceased, late of Zurich, Switzerland; Tino Gaeuman, legal representaitve, Mont Sur Lausanne; Vladimir Prelog, Zurich; Ernst Vischer, Basel, and Hans Bickel, Binningen, all of Switzerland, assignors to Ciba-Geigg Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 245,349, Dec. 11, 1962, abandoned, which is a continuation-in-part of Ser. No. 32,294, May 27, 1960, abandoned, which is a continuation-in-part of Ser. No. 749,616, July 21, 1958, abandoned. This application Oct. 19, 1966, Ser. No. 626,650

Claims priority, application Switzerland, July 26, 1957, 48868/57; July 8, 1958, 61491/58; May 29, 1959, 73755/59; Mar. 18, 1960, 3062/60

Int. Cl. A61k *21/00*

U.S. Cl. 424—118 4 Claims

1. Ferrimycin A_1 of the formula $C_{41}H_{65}O_{14}N_{10}Fe$ having pK_{MCS} values of 4.11, 7.87 and 11.4 and exhibiting the following maxima in the ultraviolet spectrum: λ_{max} 229 mμ($\epsilon_{1cm}^{1\%}$ = 336), 319 mμ($\epsilon_{1cm}^{1\%}$ = 37) and 425 mμ($\epsilon_{1cm}^{1\%}$ = 27.6) and the IR-spectrum in potassium bromide shown in FIG. 2.

3,852,425

MITOCROMIN AND PROCESS FOR PREPARING SAME

Wen-Chih Liu, Paramus, and Koppaka V. Rao, Pine Brook, both of N.J., assignors to Pfizer & Co., Inc., New York, N.Y.

Filed Nov. 27, 1968, Ser. No. 779,464
Int. Cl. A61k *21/00*
U.S. Cl. 44—119 2 Claims

1. A process for the production of the antibiotic mitocromin which comprises cultivating a microoorganism of the genus Streptomyces selected from the group consisting of *Streptomyces viridochromogenes* ATCC No. 21343, *Streptomyces griseo-laqueus* ATCC No. 21344, and Streptomyces sp. ATCC No. 21345 in an aqueous nutrient medium under submerged aerobic conditions until substantial antibiotic activity against B. subtilis is imparted to said medium.

3,852,426

PROCESS FOR PRODUCING COPYAMYCIN DERIVATIVES

Kinichi Nakano, and Norio Nishiyama, both of Tokyo, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Continuation-in-part of Ser. No. 827,402, May 23, 1969, abandoned, which is a continuation-in-part of Ser. No. 674,981, Oct. 12, 1967, abandoned. This application Mar. 31, 1970, Ser. No. 24,380
Claims priority, application Japan, Oct. 13, 1966, 41-66900
Int. Cl. A61k *21/00*
U.S. Cl. 424—120 6 Claims

1. Acetyl copiamycin having the infra-red absorption spectrum of FIG. 1 and the following elemental analysis:

C—58.54%
H—8.83%
N—3.08%

and having a melting point of 100–103 °C.

3,852,427

SODIUM BICARBONATE SPHERULITES FROM SODIUM D ESQUICARBONATE

Robert J. Hoffman, Liverpool, and Lawrence P. Gould, Syracuse, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 12, 1973, Ser. No. 350,455
Int. Cl. C01d *7/10, 7/12, 7/40*
U.S. Cl. 423—422 6 Claims

1. A process for making sodium bicarbonate in the form of crystalline spherules from sodium sesquicarbonate comprising:

a. preparing an aqueous solution of the sodium sesquicarbonate;

b. introducing 150 to 2,000 ppm by weight of a water-soluble alkali metal phosphate selected from the group consisting of $(NaPO_3)_6$, $K_5P_3O_{10}$, $Na_5P_3O_{10}$, $Na_4P_2O_7$ and $K_4P_2O_7$;

c. carbonating the solution at an initial temperature of about 45° to 70°C., cooling the solution gradually during the carbonation to below about 35°C. while continuing carbonation until substantially all of the sodium carbonate has been converted to bicarbonate; and

d. recovering the resulting sodium bicarbonate product from the carbonated solution.

3,852,428

MANUFACTURE OF CARBON FIBRES

John Lawrence Powell, Lower Kingswood; Peter John Winter, Great Bookham, and Ernest Pritchard, Woking, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Aug. 24, 1971, Ser. No. 174,552
Claims priority, application Great Britain, Sept. 8, 1970, 42992/70
Int. Cl. C01b *31/07*
U.S. Cl. 423—447 4 Claims

1. In a process for the production of fibers, filaments or films consisting essentially of carbon by spinning or extruding organic material consisting mainly of hydrocarbons selected from the group consisting of an extract of coal, pitch from coal, tar from coal and a bitumen to form a fiber, filament or film of said organic material; oxidizing the fiber, filament or film whereby the spun or extruded fiber, filament or film is stabilized to heat treatment and carbonizing the stabilized fiber, filament or film whereby a fiber, filament or film consisting essentially of carbon is formed; the improvement whereby the said organic material spun or extruded consisting of hydrocarbons contains as an additive thoroughly dissolved or dispersed in said organic material from 0.05 to 30 percent by weight of one or more polymers compatible with said organic material and being selected from the group consisting of polypropylene and polymethylmethacrylate.

3,852,429

METHOD FOR PRODUCTION OF SHAPED CARBON ARTICLES

Naohiro Murayama, and Takayuki Katto, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-To, Japan

Continuation-in-part of Ser. No. 62,210, Aug. 7, 1970,. This application Apr. 9, 1973, Ser. No. 349,127
Int. Cl. B29c *25/00*
U.S. Cl. 423—449 12 Claims

1. A method for producing a shaped carbon article from a shaped polymer while retaining the original shape of the shaped polymer, which comprises the steps of:

a. subjecting a shaped body of a polymer material selected from the group consisting of a vinylidene fluoride homopolymer and copolymers thereof, containing vinylidene fluoride as the principal constituent, to a pretreatment with a nucleophilic reagent selected from the group consisting of ammonia, a liquid ammonia-sodium system, ethylene-diamine, n-butylamine, and di-n-butylamine at a temperature of from a room temperature to 90°C for a time period until the fluorine content of the shaped body is reduced by 0.5 to 4.5 percent by weight with respect to the weight of the original polymer shaped body; and

b. heat-treating the thus pretreated and infusibilized polymer shaped body in an inactive gas atmosphere by raising the heating temperature to the maximum range of from 300° to 500°C to remove hydrogen fluoride therefrom, thereby producing the carbonized shaped article.

3,852,430

METHOD FOR THE PRODUCTION OF CONCENTRATED HYDROHALOGEN ACIDS AND METAL OXIDES

Rainer Lienau, Planegg, and Friedrich Hofmann, Saarbruecken, both of Germany, assignors to Sud-Chemie Aktiengesellschaft, Munich, Germany

Division of Ser. No. 38,185, May 18, 1970, Pat. No. 3,658,483. This application Oct. 18, 1971, Ser. No. 190,259
Int. Cl. C01b *7/00, 7/08;* C01g *1/02*
U.S. Cl. 423—481 14 Claims

1. Process for producing concentrated aqueous hydrohalogen acids and metal oxides from aqueous solutions of divalent and/or polyvalent metal halides which comprises:

a. pre-concentrating said aqueous solution by indirect heat exchange;

b. evaporating the pre-concentrated solution to a solids content of from about 40 to about 60 percent by weight by directly contacting said pre-concentrated solution with the combustion gases of a submerged combustion evaporator, and using the waste heat of said submerged combustion evaporator to pre-concentrate said aqueous solution in step (a);

c. decomposing the evaporated concentrate at elevated temperatures in the presence of water vapor into the corresponding hydrogen halides and metal oxides;

d. cooling the hydrogen halides; and

e. recovering concentrated aqueous hydrohalogen acids and the corresponding metal oxides.

3,852,431
METHOD OF OBTAINING TITANIUM TANNING AGENT AND ITS APPLICATION FOR TANNING HIDES, PELTS AND FUR SKINS

David Lazarevich Motov, ulitsa Fersmana, 18, kv. 19; Vladimir Ivanovich Konstantinov, ulitsa Fersmana, 18, kv. 44; Vladimir Georgievich Rumyantsev, Zapadnaya ulitsa, 3, kv. 56; Valentin Ivanovich Belokoskov, ulitsa Fersmana, 16, kv. 19; Eduard Osvaldovich Ude, ulitsa Fersmana, 22, kv. 12; Artur Grigorievich Babkin, ulitsa Fersmana, 18, kv. 34, all of Apatity, Murmanskoi oblasti; Alexandr Ivanovich Metelkin, Nagornaya ulitsa, 46/48, korpus 20, kv. 31, Moscow; Vasily Georgievich Suchkov, Leninsky prospekt, 87a, korpus 4, kv. 48, Moscow; Nina Ivanova Kolesnikova, Izmailovo, Nikitinskaya ulitsa, 31, kv. 31, Moscow; Alexandr Vasilievich Motovilin, ulitsa Dzerzhinskogo, 185, kv. 55., Taganrog, Rostovskoi oblasti; Nina Trofimovna Rusakova, ulitsa Rudneva, 1a, kv. 71, Vladivostok; Tatyana Vladimirovna Nixonova, bulvar Generala Karbysheva, 7, korpus 6, kv. 32, Moscow; Nina Ivanovna Polyaninova, ulitsa Dzerzhinskogo, 174 A, kv. 10, Taganrog; Mikhail Griegorievich Sinenko, ulitsa Dzerzhinskogo, 183, kv. 21., Taganrog, Rostovskoi oblasti; Irina Fedorovna Krylova, Komsomolsky prospekt, 19, kv. 36, Moscow, and Vladimir Mikhailovich Yakutin, ulitsa Dzerzhinskogo, 185, Taganrog, Rostovskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 20,133, March 16, 1970, abandoned. This application Dec. 11, 1972, Ser. No. 314,038

Int. Cl. C01c *1/24*

U.S. Cl. 423—549 **1 Claim**

1. A method for preparing ammonium titanyl double sulfate monohydrate which comprises dissolving titanium-containing material in sulfuric acid to form a solution containing titanium-ions; adding ammonium sulfate to said solution in an amount of 180 to 300 g/l and adjusting the content of H_2SO_4 to 300 to 450 g/l while keeping the aggregate concentration of ammonium sulfate and H_2SO_4 to from 520 to 620 g/1 in order to precipitate substantially all the titanium from said solution as ammonium titanyl double sulfate monohydrate, $(NH_4)_2\ TiO(SO_4)_2\ H_2O$, at a temperature of 12° to 30°C.; removing said precipitate; washing said precipitate with a solution containing 300 to 450 g/l H_2SO_4 and 180 to 300 g/l of $(NH_4)_2SO_4$; and then washing the precipitate with a solution containing 300 to 400 g/l of ammonium sulfate to produce a stabilized ammonium titanyl double sulfate, monohydrate.

3,852,432
DIAGNOSTIC DEVICE AND METHOD OF TREATMENT

Robert I. Henkin, Bethesda, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Division of Ser. No. 107,279, Jan. 18, 1971,. This application Aug. 21, 1972, Ser. No. 282,024

Int. Cl. A61k *27/00*

U.S. Cl. 424—145 **2 Claims**

1. The method of treating idiopathic hypogeusia in humans consisting of administering orally to a patient suffering therefrom, from 25 to 150 milligrams of zinc ion daily, in the form of a salt selected from the group consisting of zinc acetate, zinc chloride and zinc sulfate.

3,852,433
URIDINE-5-MONOPHOSPHATE COMPOSITIONS

Shunkichi Tamura, Funabashi, Japan, assignor to Yamasa Shoyu Kabushiki Kaisha, Chiba-ken, Japan

Filed Apr. 6, 1973, Ser. No. 348,658

Int. Cl. A01n *9/00, 9/28*

U.S. Cl. 424—180 **8 Claims**

1. A pharmaceutical composition as an accelerator for glucuronide formation in dosage unit form comprising an effective amount of uridine-5′-monophosphate or its pharmaceutically acceptable salt as active ingredient and a pharmaceutical carrier.

3,852,434
POTENTIATION OF (−) CIS-1,2-EPOXYPROPYL)PHOSPHONIC ACID AND ANALOGUES THEREOF

Frederick M. Kahan, and Patrick J. Cassidy, both of Rahway, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 71,247, Sept. 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 863,351, Oct. 2, 1969, abandoned. This application Apr. 20, 1973, Ser. No. 353,046

Int. Cl. A61k *21/00, 27/00*

U.S. Cl. 424—180 **14 Claims**

1. A method of potentiating the activity of a phosphonomycin antibiotic in antibiotic therapy which comprises contacting susceptible bacteria with an effective amount of an inducer capable of providing a hexose-phosphate transport system or enhancing the α-glycerophosphate transport system for said bacteria and later or concomitantly contacting said bacteria with an effective amount of a phosphonomycin antibiotic.

3,852,435
URIDINE-5′-DIPHOSPHATE-GLUCURONIC ACID COMPOSITIONS

Shunkichi Tamura, Funabashi, Japan, assignor to Yamasa Shoyu Kabushiki Kaisha

Filed Oct. 30, 1972, Ser. No. 301,728

Int. Cl. A01n *9/00, 9/28*

U.S. Cl. 424—180 **8 Claims**

1. A pharmaceutical composition as an accelerator for glucuronide formation in a dosage unit form selected from the group consisting of powder, tablets, pills capsules, dragees and aqueous solutions comprising uridine-5′-diphosphate glucuronic acid or its sodium salt as an active ingredient and a pharmaceutical carrier.

3,852,436
BIOCIDAL COMPOSITIONS AND THEIR METHOD OF PREPARATION EMPLOYING A GRAPEFRUIT DERIVATIVE

Jakob Harich, Orlando, Fla., assignor to Rush-Hampton, Inc., Longwood, Fla.

Filed Apr. 29, 1971, Ser. No. 138,817

Int. Cl. A01n *9/02, 9/08*

U.S. Cl. 424—195 **12 Claims**

1. A method of preparing an antibacterial and antifungal composition comprising:

1. adding tetrachloroethylene to an organic alcoholic ether selected from the group consisting of 2-phenoxy-ethanol, diethylene glycol methyl ether, ethylene glycol ethyl

ether, and mixtures thereof, at a temperature between about 180° and 200°F. to form a first intermediate mixture the weight ratio of tetrachloroethylene to alcoholic ether being about between 3:2 and 2:3;

2. adding, based on 140 to 160 grams of organic ether, between about 16 to 21 grams of 2,3,5,6-tetrachloro-4-(methyl sulfonyl) pyridine, between about 40 to 46 grams of salicylanilide, and 30 to 50 grams of a polyhalo substituted diaryl selected from the group consisting of 3,4,5,-tribromosalicylanilide, 2,4,4'-trichloro-2'-hydroxydiphenyl ether, and mixtures thereof, to the mixture of step 1 to obtain a reaction mixture, said additions being carried out at a temperature between about 180° and 200°F;
3. adding, based on 140 to 160 grams of organic ether, 3 to 5 grams of at least one substituted dimethyl benzyl ammonium chloride to the reaction mixture and heating at a temperature between about 180° and 200°F. to obtain a final reaction product; and
4. adding, to said final reaction product, based on 140 to 160 grams of alcoholic ether, between about 20 to 85 grams of a grapefruit derivative prepared by reacting the pulps of fresh grapefruit with a non-toxic polyhydric alcohol in the presence of ultraviolet light, and separating the resultant grapefruit derivative from the pulp residue.

3,852,437

STABLE PESTICIDAL COMPOSITIONS

Hans Helfenberger, Reinach, Switzerland, assignor to Sandoz Ltd., Basle, Switzerland

Continuation-in-part of Ser. No. 876,089, Nov. 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 703,280, Feb. 6, 1968, abandoned. This application Nov. 15, 1971, Ser. No. 198,988

Claims priority, application Switzerland, Feb. 7, 1967, 1829/67

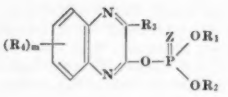
Int. Cl. A01n *9/36, 9/06*

U.S. Cl. 424—200 **11 Claims**

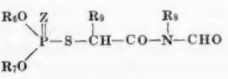
1. A stabilized insecticidal composition comprising:

A. 100 parts by weight of a compound selected from the group consisting of:

1. a compound of the formula:



and 2. a compound of the formula:



wherein

R_1 is alkyl of 1 to 4 carbon atoms,

R_2 is $-O-R_5$, $-NH-R_5$ or $-N(R_5)_2$,

R_3 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or $-COOR_1$,

R_4 is hydrogen, alkyl of 1 to 4 carbon atoms, or halo, *m* is 1, 2, 3 or 4,

R_5 is alkyl of 1 to 4 carbon atoms,

each of R_6 and R_7 is independently methyl or ethyl,

R_8 is alkyl of 1 to 3 carbon atoms,

R_9 is hydrogen or alkyl of 1 to 3 carbon atoms, and

Z is oxygen or sulfur, and

B. between 0.5 part to 30 parts by weight of a stabilizing compound of the formula

$$R-N=C=X$$

wherein

X is oxygen or N—R

R is hydrogen, alkyl of up to 10 carbon atoms, cycloalkyl of from 6 to 8 carbon atoms, phenyl, phenyl substituted by one or two chloro substituents, phenyl substituted by one or two alkyl substituents in which each alkyl substituent contains up to 4 carbon atoms, nitrophenyl or phenylalkyl of 7 to 9 carbon atoms.

3,852,438

PESTICIDAL COMPOSITIONS CONTAINING 1-HALO-2-RYLOXY-VINYL-(2)-PHOSPHATES

Henry Martin, and Jozef Drabek, both of Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland

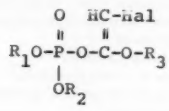
Division of Ser. No. 64,648, Aug. 17, 1970, Pat. No. 3,732,343. This application Feb. 14, 1973, Ser. No. 332,470

Claims priority, application Switzerland, Aug. 18, 1969, 12553/69; Sept. 25, 1969, 14452/69

Int. Cl. A01n *9/36*

U.S. Cl. 424—217 **21 Claims**

1. A pesticidal composition useful for combating pests selected from the group consisting of insects and acarinae comprising (1) a pesticidally effective amount of a compound of the formula



in which Hal represents chlorine or bromine; each of R_1 and R_2 represents alkyl of from 1 to 4 carbon atoms; and R_3 represents phenyl, naphthyl or phenyl substituted by from 1 to 5 substituents selected from the group consisting of halogen, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, alkylthio of from 1 to 4 carbon atoms, nitro, trifluoromethyl, cyano, the group —COO-alkyl in which the alkyl group has from 1 to 4 carbon atoms and the group —CO-alkyl in which the alkyl has from 1 to 4 carbon atoms and (2) a suitable carrier.

3,852,439

COMPOSITIONS WITH A BASE OF PHOSPHORIC ESTERS COMBINED WITH A STABILISER

Claude Hennart, Aubervilliers, and Marcel Louis Dulat, Poitiers, both of France, assignors to Ciba-Geigy AG, Basle, Switzerland

Filed Sept. 14, 1971, Ser. No. 180,507

Claims priority, application France, Sept. 11, 1970, 70.33013

Int. Cl. A01n *9/36*

U.S. Cl. 424—219 **6 Claims**

1. A pesticidal composition consisting essentially of:

A. at least one phosphoric ester insecticide, the molecule of which has at least one alkyl group of one to three carbon atoms attached to the phosphoric anion wherein on contact with molecules of water, at least partial decomposition of the ester takes place by protonization replacement of said lower alkyl group by hydrogen, and

B. a 1,3-benzodioxole insecticide synergist as a principal agent for stabilizing the said ester against decomposition by protonization and used in an effective stabilizing amount of from at least about 0.2 to not more than about

10% based on the weight of the phosphoric ester, said benzodioxole having no action as a toxicity synergist for the insecticide phosphoric acid ester in said proportions, said benzodioxole being selected from the group consisting of:

5(2-octylsulphinylpropyl) benzodioxole
5-propyl-6-(2,5,8-trioxadodecyl) benzodioxole
5-allyl benzodioxole
5-formyl benzodioxole
5-(3,6,9-trioxa undecyl-2-oxy) benzodioxole
5,6-bis(propyoxycarbonyl)-7-methyl-5,6,7,8-tetrahydro naphtho(2,3,-d)-1,3-dioxole
2,6-bis(5-benzodioxole-1,3-yl)-3,7-dioxabicyclo(3,3,0) octane
2-(5-benzodioxole-1,3,yl)-6-(5-benzodioxole-1,3-yl-oxy)-3,7-dioxabicyclo(3,3,0) octane
5-hydroxy benzodioxole
5-hydroxymethyl benzodioxole
5-(propen-1-yl) benzodioxole
5-acetonyl benzodioxole
5-(3-oxo-buten-1-yl) benzodioxole
5-cyanomethyl benzodioxole
5-(2-amino propyl) benzodioxole
5-(5-methyl 4-dioxane-1,3-yl) benzodioxole
5-benzoylmethyl benzodioxole
benzodioxole
5-bromo benzodioxole
5-nitrobenzodioxole
5-cyanobenzodioxole
5(2-N-phenylcarbamyl ethyl) benzodioxole
5[2-(4-methylbenzoyl)vinyl]benzodioxole
5-propyl benzodioxole
5(2-nitrovinyl) benzodioxole
N-piperonylidene (4-methyl aniline)
N-piperonylidene (5-chloro-2,4-dimethoxy aniline)
5-methoxy benzodioxole
sodium 7-methyl-5,6,7,8-tetrahydronaphtho[2,3-d]1,3dioxole 5,6-dicarboxylate
zine 3(5-benzodioxole) acrylate
piperidine 3-(5-benzodioxole) acrylate
lead 3-(5-benzodioxole) acrylate
piperidine 5-benzodioxole carboxylate
2-benzoyl 3-(2-pyrrolidinoethoxy)(1,3-dioxolo) [4,5-f]indole
1-(4-methyl-2-nitrophenyl azo)-3-ethoxycarbonyl-4,4-dimethyl-1,2,6-dioxo cyclohexane
5-allyl benzodioxole
5-(3-oxo-butene-1-yl) benzodioxole

3,852,440

REDUCING CHOLESTEROL LEVELS WITH SITOSTEROLS AND CHOLANIC ACID DERIVATIVES

Alan Hugh Weigand, Fort Lee, N.J., assignor to Intellectual Property Development Corporation, New Rochelle, N.Y.

Continuation-in-part of Ser. No. 208,887, Dec. 16, 1971, abandoned, and a continuation-in-part of Ser. No. 259,062, July 2, 1972, abandoned, which is a continuation of Ser. No. 126,296, March 19, 1971, abandoned. This application Nov. 13, 1972, Ser. No. 304,295

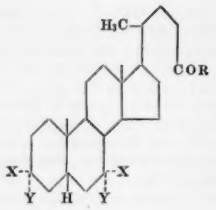
Int. Cl. A61k *17/00*

U.S. Cl. 424—239 **10 Claims**

1. A composition useful in reducing the cholesterol and lipid levels of human beings which consists of, in combination;

a. A small but effective amount sufficient to effect a reduction in the cholesterol and lipid levels of said human being, of a sitosterol selected from the group consisting of α-sitosterol, β-sitosterol, and γ-sitosterol; and

b. A small but effective amount sufficient to effect a reduction in the cholesterol and lipid levels of said human being, of a steroid compound of the formula:



wherein

R is hydroxy, acyloxy of a hydrocarbon carboxylic acid of less than 12 carbon atoms, alkoxy of less than 13 carbon atoms, $NHCH_2COOH$, or $NHCH_2CH_2SO_3H$;

each X is hydrogen;

each Y is hydroxy, or acyloxy of a hydrocarbon carboxylic acid of less than 12 carbon atoms;

and X and Y when taken together is oxo (**0**=); and the non-toxic, pharmaceutically acceptable salts thereof.

3,852,441

SYNERGISTIC MIXTURES OF DIPHENYLBISMUTH ACETATE AND THE ZINC SALT OF 1-HYDROXY-2-PYRIDINE THIONE EFFECT AS ANTIBACTERIAL AND ANTIFUNGAL AGENTS

John A. Kooistra, Jr., Forest Park, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 98,085, Dec. 14, 1970, abandoned. This application Mar. 14, 1973, Ser. No. 341,191

Int. Cl. A01n *9/02, 9/22, 11/001*

U.S. Cl. 424—245 **2 Claims**

1. An antibacterial and antifungal composition, active against *Pseudomonus aeruginosa* and *Escherichia coli bacteria*, said composition containing a mixture of:

A. zinc 1-hydroxy-2-pyridinethione; and

B. diphenylbismuth acetate in the ratio of (A) to (B) of from about 1:9 to about 9:1.

3,852,442

PHARMACEUTICAL COMPOSITIONS CONTAINING ORGANOMETALLIC DERIVATIVES OF 6-LOWER ALKOXY-1-PHENAZINE 5,10-DIOXIDE

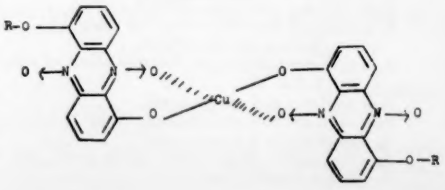
Willy Leimgruber, Montclair, N.J.; Gian Paolo Maestrone, Stanten Island, N.Y.; Milan Mitrovic, Nutley, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffman-La Roche, Nutley, N.J.

Continuation-in-part of Ser. No. 814,429, April 8, 1969, Pat. No. 3,586,674, which is a continuation-in-part of Ser. No. 739,191, June 24, 1968, abandoned. This application Apr. 23, 1971, Ser. No. 139,291

Int. Cl. A01n *9/22;* **A61k** *27/00*

U.S. Cl. 424—245 **32 Claims**

1. A composition for the treatment of localized topical microbial infections comprising as the active ingredient a compound represented by the formula



wherein R is lower alkyl of 1 to 3 carbon atoms together with a pharmaceutically acceptable carrier wherein the amount of the compound is effective in treating the localized topical microbial infection.

3,852,443

2-MERCAPTOQUINOXALINE-1-OXIDES, SALTS THEREOF AND-(1-OXOQUINOXALINYL) DISULFIDES FOR TREATING HAIR AND SKIN

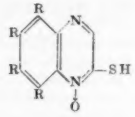
Miriam Lois Douglass, Bound Brook, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 880,413, Nov. 26, 1969, Pat. No. 3,733,323. This application Nov. 6, 1972, Ser. No. 303,778

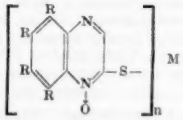
Int. Cl. A61k *27/00*

U.S. Cl. 424—250 **5 Claims**

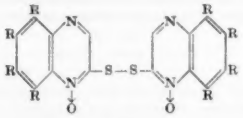
1. A method for counteracting the growth of microbes selected from the group consisting of bacteria and fungi on skin or hair which comprises applying to the skin or hair a fungicidol or bactericidol amount of a compound selected from the group consisting of 2-mercaptoquinoxaline-1-oxides of the formula



salts thereof of the formula



and disulfides thereof of the formula



wherein R is hydrogen or an alkyl group of 1 to 12 carbon atoms, M is selected from the group consisting of alkali metals, alkaline earth metals, transition element metals, Group III A metals, Group IV A metals, Group V A metals, ammonium and quaternary ammonium, wherein substitutents on the quaternary nitrogen are selected from the group consisting of alkyl groups of 1 to 18 carbon atoms, and arylalkyl groups of 7 to 24 carbon atoms, and *n*, representing the valence of M, is either 1, 2 or 3.

3,852,444

FUNGICIDAL AND BACTERICIDAL 2-(N-2-CYANOETHYLDITHIOCARBAMYLMETHYLENE--HYDROXY-4H-PYRAN-4-ONE AND METAL CHELATES

John Joseph D'Amico, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 228,368, Feb. 22, 1973, Pat. No. 3,799,945. This application Dec. 3, 1973, Ser. No. 421,312

Int. Cl. A01n *9/00*

U.S. Cl. 425—245 **11 Claims**

1. The method of inhibiting the growth of fungi or bacteria which comprises applying to the habitat of the organism a fungicidal or bactericidal amount of 2-(N-2-cyanoethyldithiocarbamylmethylene)-5-hydroxy-4H-pyran-4-one or a metal chelate thereof.

3,852,445

[CNS COMPOSITIONS AND METHOD WITH 4-(5,10-DIHYDRO-4H-BENZO[5,6]CYCLOHEPTA[1,2-B]THIENYL-4-YL)-1-PIPERAZINYL-ALKYL]-3-ALKYL-2-IMIDAZOLIDINONES

Guenther Doerhoefer, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

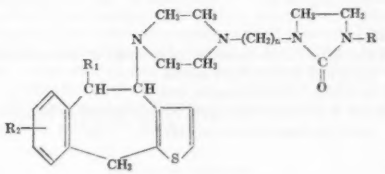
Division of Ser. No. 260,877, June 8, 1972,. This application July 5, 1973, Ser. No. 376,759

Claims priority, application Switzerland, June 17, 1971, 8822/71

Int. Cl. A61k *27/00*

U.S. Cl. 424—250 **4 Claims**

1. A therapeutic preparation comprising a central nervous system depressantly effective amount of a compound of the formula I



(I)

wherein

R is a lower alkyl group having 1 to 4 carbon atoms,

R_1 is hydrogen or the methyl group,

R_2 is hydrogen, halogen up to atomic number 35, trifluoromethyl, a lower alkyl or alkoxy group having 1 to 4 carbon atoms, or a di-lower alkylsulphamoyl group of which the lower alkyl groups each have 1 to 4 carbon atoms, and

n is 2 or 3

or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutical excipient.

3,852,446

ORGANIC COMPOUNDS IN TREATMENT OF PSYCHOTIC DISTURBANCES

Jean Schmutz, Muri Near Berne, and Fritz Hunziker, Berne, both of Switzerland, assignors to Sandoz, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 60,976, July 6, 1970, Pat. No. 3,758,479, which is a division of Ser. No. 769,373, Oct. 21, 1968, Pat. No. 3,539,573, which is a continuation-in-part of Ser. No. 712,956, March 14, 1968, abandoned. This application Mar. 19, 1973, Ser. No. 342,399

Claims priority, application Switzerland, Mar. 13, 1967, 3582/67; Mar. 22, 1967, 4103/67; May 9, 1967, 6557/67; July 14, 1967, 10115/67; Nov. 3, 1967, 15453/67; Feb. 14, 1968, 2201/68

Int. Cl. A61k *27/00*

U.S. Cl. 424—250 **7 Claims**

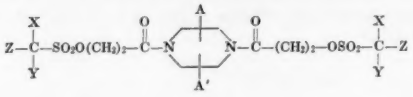
1. A pharmaceutical composition in the form of a tablet, capsule or dragee useful in treating psychotic disturbances in animals comprising as active ingredient, a therapeutically effective amount of 2-nitro-11-(4-methyl-1-piperazinyl)dibenzo[b,f] [1,4]thiazepine, or a pharmaceutically acceptable acid addition salt thereof, in association with a pharmaceutical carrier or diluent.

3,852,447
PHARMACEUTICAL COMPOSITIONS CONTAINING SULFONATE DERIVATIVES OF 1,4-BIS(PROPIONYL) PIPERAZINE

Alexander Senning, Brabrand; Hans Christian Buchholt, Risskov, both of Denmark; Robert Bierling, Wuppertal-Elberfeld, Germany; Dieter Steinhoff, Bochum, Germany, and Gerhard Trossmann, Bonn-Bad Godesberg, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 180,501, Sept. 14, 1971, Pat. No. 3,798,222. This application Mar. 23, 1973, Ser. No. 344,141
Claims priority, application Germany, Sept. 18, 1970, 2046087
Int. Cl. A61k *27/00*
U.S. Cl. 424—250 6 Claims

1. A composition comprising in unit dosage form from 0.5 to 90% by weight of a compound of the formula:



in which

A and A′ are each hydrogen or primary or secondary lower alkyl of 1 to 6 carbon atoms;

Z is chloro, bromo or iodo, and

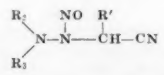
X and Y are each hydrogen, chloro, bromo or iodo, and an inert pharmaceutical carrier.

3,852,448
N-SUBSTITUTED AMINO-N-NITROSO-AMINOACETONITRILES FOR TREATING HYPERTENSION

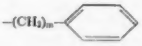
Paul L. Anderson, Dover, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Division of Ser. Nos. 326,405, Feb. 4, 1971, Pat. No. 3,780,180, which is a continuation-in-part of Ser. No. 41,056, May 27, 1970, abandoned. This application Aug. 22, 1973, Ser. No. 390,531
Int. Cl. A61k *27/00*
U.S. Cl. 424—250 2 Claims

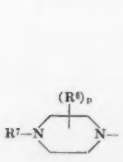
1. A method for treating hypertension, which comprises orally or parentally administering to a mammal is need of said treatment an anti-hypertensive effective amount of a compound of the formula,



in which R^1 represents hydrogen, alkyl or

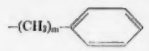


where m is 0, 1 or 2 and in which R_2 and R_3 together with N represent

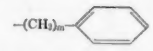


where p is 0, 1 or 2,

R^6 Represent hydroxy; halo having an atomic weight of about 19 to 36; lower alkyl; lower alkoxy; alkanoyl having 2 to 4 carbon atoms; alkanoyloxy having 2 to 4 carbon atoms; ω-hydroxy lower alkyl; alkoxyalkyl having 2 to 4 carbon atoms substituted with 1 to 4 halogen atoms having an atomic weight between about 19 to 36; or



where R^7 is hydrogen; lower alkyl; alkanoyl having 2 to 4 carbon atoms; ω-hydroxy lower alkyl; alkoxyalkyl having 2 to 4 carbon atoms; lower alkyl having 1 to 4 carbon atoms substituted with 1 to 4 halogen atoms having an atomic weight between 19 to 36; or

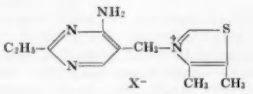


3,852,449
TREATMENT AND PREVENTION OF COCCIDIOSIS IN POULTRY

Toshio Ishii; Yasuto Takamatsu, both of Tokyo; Shojiro Yurugi, Kyoto, and Katsutada Masuda, Ashiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 7,362, Jan. 30, 1970, , which is a continuation of Ser. No. 621,753, March 9, 1967, abandoned. This application Oct. 26, 1971, Ser. No. 192,326
Claims priority, application Japan, May 30, 1966, 41-34922
Int. Cl. A61k *27/00*
U.S. Cl. 424—251 6 Claims

1. A method for the treatment or prevention of coccidiosis in poultry, which comprises administering to the poultry an effective amount of thiazolium mono salt of the formula



wherein X^- is a member selected from the group consisting of NO_3^-, NO_2^-, I^-, SCN^- and ClO_4^-

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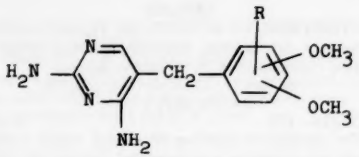
3,852,450
ANTIBACTERIAL COMPOSITIONS CONTAINING RIFAMPICIN AND A PYRIMIDINE DERIVATIVE

Luigi Silvestri, Fara, and Vittorio Arioli, Como, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Dec. 14, 1972, Ser. No. 315,107
Claims priority, application Italy, Dec. 23, 1971, 32838/71
Int. Cl. A61k *21/00, 27/00*
U.S. Cl. 424—251 13 Claims

1. A composition comprising a pyrimidine compound selected from a compound corresponding to the formula:



wherein R represents hydrogen, methoxy or lower alkyl, and the salts thereof with pharmaceutically acceptable acids; and from about 0.2 to about 10 parts by weight of rifampicin per part by weight of the pyrimidine compound.

3,852,451

PIG GROWTH FEED COMPOSITION CONTAINING METHYL XANTHINES AND SALTS OF METHYL XANTHINES AND METHOD OF USE

Hugh M. Cunningham, 1054 Castle Hill Cres., Ottawa, Canada

Continuation-in-part of Ser. No. 728,881, May 14, 1968, abandoned. This application Dec. 3, 1971, Ser. No. 204,677

Int. Cl. A61k *27/00*

U.S. Cl. 424—253 **20 Claims**

1. A method of increasing at least one of the feed efficiency and the protein to fat ratio of pigs; or of regulating the growth rate of pigs, comprising; administering orally to a pig a compound selected from the group consisting of methyl xanthines and ingestable salts of methyl xanthines, said compound being administered in an effective amount equivalent to between about 0.25 to 2.5 grams of 1, 3, 7-trimethyl xanthine per kg of feed.

3,852,452

BENZOCYCLOHEPTAISOQUINOLINE DERIVATIVES AS CNS DEPRESSANTS

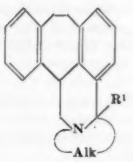
Francois T. Bruderlein, Montreal, and Leslie G. Humber, Dollard des Ormeaux, Quebec, both of Canada, assignors to Ayerst, McKenna and Harris Limited, Quebec, Canada

Continuation-in-part of Ser. No. 97,481, Dec. 21, 1970, , which is a continuation-in-part of Ser. No. 10,306, Feb. 10, 1970, Pat. No. 3,657,250. This application Apr. 10, 1972, Ser. No. 242,839

Int. Cl. A61k *27/00*

U.S. Cl. 424—258 **2 Claims**

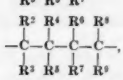
1. A pharmaceutical composition having central nervous system activity containing a carrier and an amount up to about 500 milligrams effective to produce a central nervous system depressant effect in a mammal without deleterious side-effects of a compound selected from those of the formula:



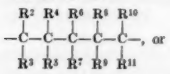
in which R^1 is selected from the group which consists of hydrogen and lower alkyl, and Alk represents an organic radical selected from the group which consists of

A:

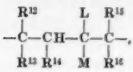
B:



C:



D:



designated A, B, C or D respectively, in which R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, and R^{16} are each the same or different radicals selected from the group which consists of hydrogen and lower alkyl, with the proviso that the carbon atoms to which R^2 and R^3, or R^{12} and R^{13} are attached is bonded to the nitrogen atom of said compound; L represents hydroxyl or lower alkanoyloxy; and M is selected from the group which consists of hydrogen, lower alkyl, lower alkenyl, lower alkynyl, and cycloalkyl containing from three to six carbon atoms which may be optionally substituted by lower alkyl or phenyl; and their acid addition salts with pharmaceutically acceptable acids.

3,852,453

METHOD OF ENHANCING VINCAMINE COMPOSITIONS

Don Pierre Rene Lucien Giudicelli, Fontenay-sous-Bois, and Jean-Pierre Rene Gabriel, Tours, both of France, assignors to Synthelabo, Paris, France

Filed May 21, 1973, Ser. No. 362,239

Claims priority, application France, May 26, 1972, 72.18880; June 21, 1972, 72.22289; May 9, 1973, 73.16633

Int. Cl. A61k *27/00*

U.S. Cl. 424—262 **3 Claims**

1. In the method of providing an enhanced serum level of an orally administered vincamine compound selected from the group consisting of vincamine, vincaminol, vincanol, vincamone, vincaminic acid, apovincaminic acid, desoxyvincaminic acid, and the pharmaceutically acceptable salts, amides, esters and N-oxide forms thereof to a patient, the improvement which comprises orally administering to said patient a mixture of said vincamine compound and ascorbic acid or a pharmaceutically acceptable salt thereof, the ratio of said vincamine compound to said ascorbic acid being from about 2:1 to 1:5.

3,852,454

TREATMENT OF RHEUMATOID ARTHRITIS

Israeli A. Jaffe, New York, N.Y., assignor to Merck & Co., Inc., Rahway, N.J.

Filed June 15, 1973, Ser. No. 368,773

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 **3 Claims**

1. A method of treating rheumatoid arthritis which consists of administering to a patient in need of such treatment an effective amount of 5-mercaptopyridoxine, pyrithioxine, or pharmaceutically acceptable salts thereof.

3,852,455
4-[4(α-HYDROXYBENZYL)PIPERIDINO)]4-1 FLUOROBUTYROPHENONE DERIVATIVES AS TRANQUILIZERS

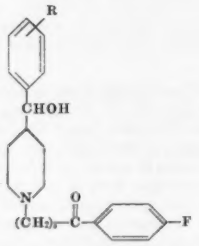
Albert A. Carr, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., New York, N.Y.

Continuation of Ser. No. 93,495, Nov. 27, 1970, abandoned. This application May 3, 1972, Ser. No. 249,886

Int. Cl. A61u *27/00*

U.S. Cl. 424—267 **7 Claims**

1. A method of obtaining tranquilizing effects in a patient comprising administering to said patient from 0.005 to 10 milligrams per kilogram of body weight of the patient a compound of the formula



wherein R is a member selected from the group consisting of chlorine, fluorine, bromine, alkyl having from 1 to 4 carbon atoms, or alkoxy having from 1 to 4 carbon atoms and is attached at the para position of the phenyl ring; or a pharmaceutically acceptable acid addition salt thereof.

3,852,456
METHOD FOR CONTROLLING PSORIASIS

Sydney H. Silverman, 20821 Wakefield, Southfield, Mich. 48075

Filed Aug. 24, 1973, Ser. No. 391,456

Int. Cl. A61k *27/00*

U.S. Cl. 424—267 **6 Claims**

1. A method for arresting and controlling psoriatic conditions in a human comprising:

administering pentazocine in therapeutic quantities.

3,852,457
CARBAMOYLBENZOTRIAZOLE ANTHELMINTICS

Maurice William Baker, Clifton; Jennifer Crowley, Newark; Thomas Iswel Watkins, West Bridgeford, and Nigel George Clark, St. Albans, all of England, assignors to Boots Pure Drug Company Limited, West Nottingham, England

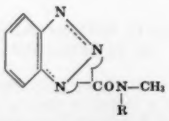
Division of Ser. No. 162,622, July 14, 1971, Pat. No. 3,732,238. This application Feb. 7, 1973, Ser. No. 330,338

Claims priority, application Great Britain, Aug. 5, 1970, 37878/70

Int. Cl. A61k *27/00*

U.S. Cl. 424—269 **4 Claims**

1. A pharmaceutical composition having anthelmintic activity in dosage unit form comprising a pharmaceutical carrier and an anthelmintically effective amount of a compound of the formula



in which R is alkyl of from 5–9 carbon atoms.

3,852,458
ANTIDEPRESSIVE ACTIVITY OF TETRAMISOLE

Paul Adriaan Jan Janssen, Vosselaar, Belgium, assignor to Janssen Pharmaceutical N.V., Beerse, Belgium

Filed July 11, 1973, Ser. No. 378,306

Int. Cl. A61k *27/00*

U.S. Cl. 424—270 **5 Claims**

1. The method of relieving depression which comprises internally administering to a depressed mammal an effective anti-depressant amount of a member selected from the group consisting of the racemic, dextro and levo form of 2,3,5,6-tetrahydro-6-phenylimidazo[2,1-b]thiazole and the therapeutically active acid addition salts thereof as an active ingredient in admixture with a pharmaceutically acceptable carrier.

3,852,459
METHOD OF PREPARATION AND PACKAGING OF INJECTABLE NITROFURANTOIN SODIUM

Leslie Boros, Plainview, N.Y., and Diana Loftin, Houston, Tex., assignors to Savage Laboratories, Inc., Houston, Tex.

Filed June 20, 1972, Ser. No. 264,670

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 **8 Claims**

1. A process for the preparation of nitrofurantoin sodium dissolved in a solution suitable for intravenous injection, comprising the steps of forming a dispersion by suspending finely divided nitrofurantoin in an isotonic saline solution in the ratio of 164 mg of nitrofurantoin to 5 cc of said solution, said solution also containing 1.5 percent of benzyl alcohol and 50 percent of at least one alcohol selected from the group consisting of glycerine and propylene glycol, separately dissolving an alkaline sodium compound selected from the group consisting of sodium hydroxide and sodium carbonate in water for injection containing 1.0 to 1.5 percent of benzyl alcohol, the quantity of said alkaline sodium compound in said solution being such that on mixing said solution with an equal volume of nitrofurantoin suspension, the pH of the resultant solution lies between 8.5 and 9.5, mixing said solution and said dispersion containing suspended nitrofurantoin, and shaking the resultant mixture to bring said nitrofurantoin into solution as nitrofurantoin sodium, the quantities of nitrofurantoin and alkaline sodium compound being selected to form a dosage amount of nitrofurantoin sodium, and all steps in said process being carried out under sterile conditions.

3,852,460
ACID SALTS OF 2-BENZIMIDAZOLECARBAMIC ACID, ALKYL ESTERS AS FUNGICIDES

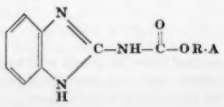
Clarence A. Littler, Rt. 1, Box 727, Sequim, Wash. 98382, and Bert Lorin Richards, Jr., 240 Larchwood Rd., Wilmington, Del. 19803

Division of Ser. No. 104,485, Jan. 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 52,144, July 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 727,070, May 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 696,694, Jan. 10, 1968, abandoned, which is a continuation-in-part of Ser. No. 629,911, April 11, 1967, abandoned. This application Nov. 2, 1972, Ser. No. 303,209

Int. Cl. A01n *9/22*

U.S. Cl. 424—273 **5 Claims**

1. A method of controlling fungi comprising applying to the locus to be protected a fungicidally effective non-phytotoxic amount of a fungicidal composition consisting essentially of a compound of the formula:



wherein
R is methyl or ethyl and
A is an acid having an ionization constant greater than 1×10^{-6} with additional acid having an ionization constant greater than 10^{-6} such that the composition at spray concentration has a pH of 4 or less.

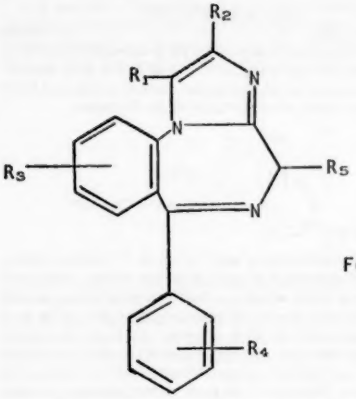
3,852,461

BENZODIAPINES USED AS MINOR TRANQUILIZERS

Jackson B. Hester, Jr., Galesburg, and Martin Gall, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 169,091, Aug. 4, 1971, abandoned. This application July 12, 1973, Ser. No. 378,527
Int. Cl. A61k *27/00*
U.S. Cl. 424—273 **19 Claims**

1. A process for treating tension and anxiety or inducing sleep comprising the administration to a human or animal subject, in unit dosage form, from about 0.001 to about 0.4 mg./kg. body weight of a compound of the formula:



Formula I

wherein R_1 and R_2 and R_3 are hydrogen or alkyl of from 1 to 3 carbon atoms, inclusive; R_5 and R_4 are hydrogen or halogen, or a pharmacologically acceptable acid addition salt thereof in association with a pharmaceutical carrier.

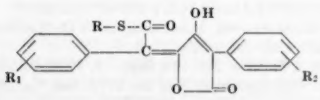
3,852,462

THIOLPULVINIC ACID DERIVATIVES

Joseph Weinstock, Phoenixville, Pa., assignor to Joseph A. Marlino; Richard D. Foggio and Smithkline Corporation, Philadelphia, Pa.

Division of Ser. No. 267,762, June 30, 1972, Pat. No. 3,780,064. This application Aug. 30, 1973, Ser. No. 393,236
Int. Cl. A61u *27/00*
U.S. Cl. 424—279 **2 Claims**

1. A pharmaceutical composition having anti-arthritic activity in dosage unit form comprising a pharmaceutical carrier and from about 10 mg. to about 50 mg. of a chemical compound of the formula:



wherein:
R is lower alkyl of from 1 to 4 carbon atoms, phenyl, or benzyl; and
R_1 and R_2 are each hydrogen, chlorine, bromine, fluorine, phenyl, trifluoromethyl, methylenedioxy in adjacent positions, lower alkyl of from 1 to 4 carbon atoms, or lower alkoxy of from 1 to 4 carbon atoms.

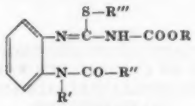
3,852,463

COMBATING FUNGI WITH AMIDOPHENYLISOTHIOUREAS

Arno Widdig, Blecher; Engelbert Kuhle, Bergisch-Gladbach; Hans Scheinpflug, Leverkusen; Ferdinand Grewe, Burscheid; Helmut Kaspers, and Paul-Ernst Frohberger, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 141,978, May 10, 1971,. This application May 15, 1973, Ser. No. 360,484
Claims priority, application Germany, May 25, 1970, 2025412
Int. Cl. A01n *9/12, 9/20*
U.S. Cl. 424—300 **9 Claims**

1. A fungicidal composition comprising a fungicidally effective amount of an amidophenylisothiourea of the formula



in which
R is lower alkyl,
R′ is hydrogen,
R″ is phenyl, phenoxymethyl, cyclohexyl, methyl, ethyl, propyl, isopropyl, butyl or isobutyl, and
R‴ is alkyl of up to 4 carbon atoms,
in admixture with a diluent.

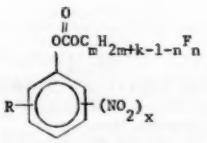
3,852,464

MITICIDAL FLUORINATED CARBONATES

Donald E. Hardies, Wadsworth, and Jay K. Rinehart, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 76,275, Sept. 28, 1970, Pat. No. 3,742,010. This application Oct. 24, 1972, Ser. No. 299,968
Int. Cl. A01n *9/20*
U.S. Cl. 424—301 **7 Claims**

1. A method of killing mites which comprises applying to the mites or their plant habitat a miticidally effective amount of a compound of the formula:



wherein
x is 1, 2 or 3;
k is −2, 0 or 2;
m is an integer ranging from 1 to 15 when k is 2;
m is an integer ranging from 2 to 15 when K is 0 or −2;
n is an integer ranging from 1 to (2m+k−1); and
R is hydrogen, lower alkyl, halo lower alkyl, lower alkenyl, halo lower alkenyl, lower alkylthio, halo lower alkylthio, lower alkenylthio, halo lower alkenylthio, lower cycloalkyl or halo lower cycloalkyl.

3,852,465

ABORTION BY MYOMETRIAL ADMINISTRATION OF PROSTAGLANDINS

Kenneth T. Kirton, Oshtemo; Edward M. Southern, Kalamazoo, both of Mich., and Jerome H. Lemelson, Metuchen, N.J., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 291,110, Sept. 21, 1972, abandoned, Continuation of Ser. No. 744,048, July 1, 1968, abandoned, and a continuation-in-part of Ser. Nos. 703,287, Feb. 6, 1968, Pat. No. 3,412,431, and Ser. No. 84,186, , said Ser. No. 744,048, is a continuation-in-part of Ser. No. 439,548, March 15, 1965, Pat. No. 3,366,993, which is a continuation-in-part of Ser. No. 734,340, May 9, 1958, Pat. No. 3,173,175, said Ser. No. 84,186, is a continuation-in-part of Ser. No. 281,306, May 17, 1963, Pat. No. 3,364,292, which is a continuation-in-part of Ser. No. 732,937, May 5, 1958, abandoned. This application Aug. 16, 1973, Ser. No. 389,000

Int. Cl. A61k *27/00*; B29d *27/04*

U.S. Cl. 424—305 8 Claims

1. A method of accomplishing a medical abortion in a gestating mammal consisting essentially of administering into the myometrial muscle a sterile pharmaceutical dosage form for myometrial injection consisting essentially of an effective non-toxic amount for accomplishing said abortion of an abortifacient prostaglandin.

3,852,466

METHOD AND COMPOSITION FOR PROPHYLAXIS AND TREATMENT OF CARDIAC DISORDERS USING 3,4,5-TRIMETHOXYBENZAMIDO-ALKANOIC ACIDS OR SALTS THEREOF

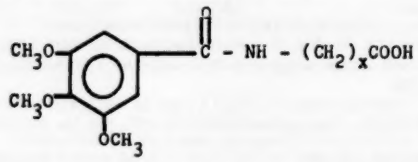
Aldo Garzia, Milan, Italy, assignor to Instituto Chemioterapico Italiano S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 50,949, June 29, 1970, Pat. No. 3,697,563, which is a continuation-in-part of Ser. No. 840,841, July 10, 1969, abandoned. This application June 15, 1972, Ser. No. 262,937

Int. Cl. A61k *27/00*

U.S. Cl. 424—318 16 Claims

1. A method of prophylaxis or for treatment of ischemic cardiac disorders in humans and animals comprising administering a compound represented by the formula



wherein x is an integer of 3 to 8 or a pharmaceutically-acceptable salt thereof at a dosage sufficient for propylaxis or for treatment of cardiac disorders.

3,852,467

ANTIINFLAMMATORY COMPOSITIONS

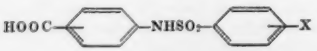
Ronald F. Borne, Oxford, Miss., assignor to The University of Mississippi, University, Miss.

Division of Ser. No. 304,485, Nov. 7, 1972, Pat. No. 3,773,712. This application July 24, 1973, Ser. No. 382,281

Int. Cl. A61k *27/00*

U.S. Cl. 424—319 26 Claims

1. Antiinflammatory composition consisting essentially of a compound having the formula:



wherein X is a halogen and a non-toxic pharmaceutically-acceptable inorganic or organic salt thereof in a theropeutically effective amount, in admixture with a non-toxic, pharmaceutically-acceptable carrier.

3,852,468

ALKANOLAMINE DERIVATIVES AS β-ADRENERGIC BLOCKING AGENTS

Ralph Howe, and Leslie Harold Smith, both of Macclesfield, England, assignors to Imperial Chemical Industrial Limited, London, England

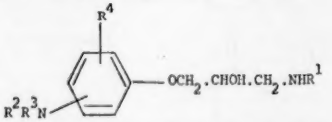
Continuation-in-part of Ser. Nos. 618,994, Feb. 27, 1967, abandoned, and Ser. No. 675,295, Oct. 16, 1967, Pat. No. 3,562,297, and Ser. No. 677,027, Oct. 23, 1967, Pat. No. 3,574,749, and Ser. No. 754,456, Aug. 21, 1968, Pat. No. 3,634,511, and Ser. No. 760,999, Sept. 19, 1968, Pat. No. 3,712,927, which is a continuation-in-part of Ser. No. 488,252, Sept. 17, 1965,. This application Nov. 6, 1970, Ser. No. 87,651

Claims priority, application Great Britain, Sept. 30, 1964, 29774/64

Int. Cl. A61k *27/00*

U.S. Cl. 424—324 15 Claims

1. A pharmaceutical composition for β-adrenergic blocking which contains as active ingredient an effective β-adrenergic blocking amount of an alkanolamine derivative selected from the group consisting of compounds of the formula:-



wherein R^1 is unsubstituted alkyl of up to 10 carbon atoms, unsubstituted cycloalkyl of up to 8 carbon atoms, or alkyl of up to 6 carbon atoms which is substituted by hydroxy, phenyl or methoxyphenyl; wherein R^2 is hydrogen or alkyl of up to 4 carbon atoms; wherein R^3 is alkanoyl of up to 10 carbon atoms, hydroxyalkanoyl, halogenoalkanoyl or alkoxycarbonyl each of up to 6 carbon atoms, alkanesulphonyl of up to 6 carbon atoms, alkenoyl of up to 6 carbon atoms, cycloalkanecarbonyl of up to 8 carbon atoms, phenylalkanoyl or phenoxyalkanoyl each of up to 10 carbon atoms, phenylalkenoyl of up to 10 carbon atoms, benzoyl, halogenobenzoyl, nitrobenzoyl, alkylbenzoyl of up to 12 carbon atoms, acylaminobenzoyl of up to 12 carbon atoms, furoyl, benzenesulphonyl or alkylbenzenesulphonyl of up to 10 carbon atoms; and wherein R^4 is hydrogen, halogen, hydroxy, nitro, cyano, acetamido, trifluoromethyl, alkyl of 1 to 10 carbon atoms, alkoxyalkyl of up to 10 carbon atoms, phenylalkyl or phenylalkoxy each of up to 10 carbon atoms, aryl or aryloxy each of up to 10 carbon atoms, cycloalkyl of up to 8 carbon atoms, hydroxyalkyl, alkoxy or alkylthio each of up to 5 carbon atoms, alkenyloxy or alkenyl each of up to 5 carbon atoms, or alkanoyl or alkoxycarbonyl each of up to 5 carbon atoms; and the non-toxic, pharmaceutically acceptable acid-addition salts thereof; said active ingredient being associated with a non-toxic, pharmaceutically acceptable or carrier therefor.

3,852,469

ANTIINFLAMMATORY COMPOSITIONS

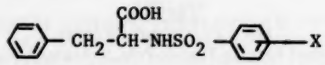
Ronald F. Borne, Oxford, Miss., assignor to The University of Mississippi, University, Miss.

Division of Ser. No. 290,404, Sept. 19, 1972, Pat. No. 3,772,377. This application July 24, 1973, Ser. No. 382,280

Int. Cl. A61k *27/00*

U.S. Cl. 424—319 10 Claims

1. Antiinflammatory composition consisting essentially of a compound in an effective amount having the formula:



wherein X is F, Cl, or Br and the non-toxic pharmaceutically acceptable inorganic or organic salts thereof in admixture with a non-toxic, pharmaceutically acceptable carrier.

3,852,470

DIHALOCYCLOPENTENEDIONE FUNGICIDAL AND BACTERICIDAL AGENTS

Klaus Grohe, Odenthal-Erberich; Helmut Kaspers, and Hans Scheinpflug, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

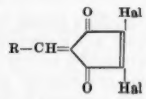
Filed Aug. 3, 1972, Ser. No. 277,826

Claims priority, application Germany, Aug. 13, 1971, 2140737

Int. Cl. A01n 9/24

U.S. Cl. 424—331 **6 Claims**

1. A method of combating fungi or phytopathogenic bacteria which comprises applying to the fungi or bacteria or a plant habitat thereof, a fungicidally or bactericidally effective amount of at least one dihalocyclopentenedione of formula



Wherein R is (a) vinyl substituted with alkyl of up to 4 carbon atoms or phenyl; or (b) unsubstituted aryl or aryl substituted with at least one substituent selected from the group consisting of chlorine, bromine, nitro, alkyl of up to 3 carbon atoms, hydroxy, methoxy, formyl, carboxy, di-(lower alkyl)-amino, (lower alkyl) (chloro-lower alkyl) amino and di-(chloro-lower alkyl) amino, and Hal is halogen.

3,852,471

SYNERGISTIC MICROBIOCIDAL COMPOSITION EMPLOYING CERTAIN PHENOLS AND A BENZYL ALCOHOL

Wilfried Paulus, and Otto Pauli, both of Farbenfabriken Bayer Aktiengesellschaft, Krefeld, Germany

Filed Oct. 2, 1970, Ser. No. 77,729

Claims priority, application Germany, Oct. 8, 1969, 1950677

Int. Cl. A01n 9/24

U.S. Cl. 424—334 **4 Claims**

1. A synergistic bactericidal, mold fungicidal and yeasticidal agent which comprises a mixture containing (1) the product produced by heating a benzyl alcohol selected from the group consisting of benzyl alcohol, 3,4-dichlorobenzyl alcohol and 0-tolyl alcohol and about 1 to 2 times the molar amount of formaldehyde in the presence of a basic catalyst, and (2) a phenol selected from the group consisting of 2-phenyl-phenol, pentachlorophenol, 4-chloro-3,5-dimethyl-phenol, 2,2'-dihydroxy-5,5'-dichloro-diphenylmethane, 3-methyl-4-chloro-phenol, 2,4,6-tribromo-phenol, 2-benzyl-4-chloro-phenol and 2,4,5-trichloro-phenol, the benzyl alcohol-formaldehyde reaction product being present in about 3 to 5 times the weight of the phenol.

3,852,472

CERTAIN ETHERS OF OPEN CHAIN TERPENOIDS AS INSECT CONTROL AGENTS

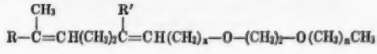
William S. Bowers, Bowie, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 78,577, Oct. 6, 1970, abandoned. This application May 23, 1973, Ser. No. 363,295

Int. Cl. A01n 9/24

U.S. Cl. 424—342 **6 Claims**

1. A method of controlling the maturation of insects selected from the group consisting of *Tenebrio molitor* (L.) and *Epilachna varivestis* comprising contacting said insects at an immature stage of growth with an effective maturation inhibiting amount of a compound of the formula



in which R and R' are straight chain alkyls containing from 1 to 2 carbon atoms; *x* is a number from 1 to 2; and *n* is a number from 0 to 3.

3,852,473

METHOD AND COMPOSITION FOR INCREASING FEED INTAKE OF ANIMALS USING TERTIARY ALCOHOLS

Clifton A. Baile, Glen Mills; Gregory Gallagher, Collegeville; Carol L. McLaughlin, Malvern, and Robert Lee Webb, West Chester, all of Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed Jan. 31, 1973, Ser. No. 328,235

Int. Cl. A61k 27/00

U.S. Cl. 424—343 **14 Claims**

1. The method of increasing feed intake in an immature ruminant animal subject comprising administering orally or by implant to said animal subject a quantity effective for increasing feed intake but nontoxic to the subject of a tertiary alcohol having the formula:

RR'R''CX

in which:

R is lower alkyl of from 1–9 carbons or hydroxy lower alkyl of from 1–9 carbons;

R' is lower alkyl of from 1–9 carbons, fluoro, bromo or chloro;

R'' is lower alkyl of from 1–9 carbons, lower alkenyl of from 2–9 carbons and, when R and R' are lower alkyl or hydrogen, phenyl; and

X is —OH.

3,852,474

ANESTHETIC TRIFLUOROMETHYLCYCLOBUTANES

Charles W. Simons, Bedford, and Robert S. Holdsworth, Arlington, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Sept. 7, 1971, Ser. No. 178,398

Int. Cl. A61k 27/00

U.S. Cl. 424—352 **5 Claims**

1. The process of inducing anesthesia in a mammal which comprises administering by inhalation to said mammal an effective quantity to induce anesthesia of a cyclobutane selected from the group consisting of the 1-chloro-2-trifluoromethyl-2,3,3-trifluorocyclobutane, 1-bromo-2-trifluoromethyl-2,3,3-trifluorocyclobutane, 1-methyl-2-trifluoromethyl-2,3,3-trifluorocyclobutane and 1,2,3,3-tetrafluoro-2-trifluoromethylcyclobutane.

3,852,475

TOPICAL COMPOSITIONS CONTAINING PETROLATUM AND HYDROPHOBIC STARCH

Emil V. Tarangul, Clinton, Conn., assignor to Chesebrough-Pond's Inc., Greenwich, Conn.

Continuation of Ser. No. 868,576, Oct. 22, 1969, abandoned. This application July 28, 1972, Ser. No. 276,121

Int. Cl. A61k *9/00, 9/06*

U.S. Cl. 424—361 2 Claims

1. A solid petrolatum composition comprising a blend of solid petrolatum and a hydrophobic starch comprising an aluminum salt of a low-substituted starch half-ester of octenyl succinic acid, wherein said starch is present in an amount sufficient to reduce the composition's greasy appearance and greasy feel and its resistance to washing with cold water and soap or detergent compositions.

3,852,476

PROCESS FOR STERILIZING FOODSTUFFS AND BEVERAGES

Yuji Nagano, 9-13, 3-Chome, Tsurukawa, Machida-shi, and Iwao Sato, 15-51, 3 Chome, Asahi-machi, Machida-shi, both of Tokyo, Japan

Filed July 27, 1973, Ser. No. 383,433

Claims priority, application Japan, July 27, 1972, 47-74628

Int. Cl. A23l *3/34*

U.S. Cl. 426—7 5 Claims

1. A process for sterilizing foodstuffs and beverages containing spore-bearing microorganisms by use of relatively low temperatures for sterilization which comprises adding thereto an enzyme selected from the group consisting of (a) cellulase, and (b) lysozyme, for a treatment period, and then subjecting said foodstuff and beverage to relatively low temperature sterilization conditions.

3,852,477

RECOVERING FLAVOR AND AROMA SUBSTANCES FROM FERMENTATION GASES

Peter Jacobus Venter, 5 Tortelduif Ave., and Johannes Daniel Malan, 5 Kroriendal Ave., both of Stellenbosch, Cape, South Africa

Continuation-in-part of Ser. No. 222,224, Jan. 31, 1972, abandoned, which is a continuation-in-part of Ser. No. 160,095, July 7, 1971, abandoned. This application Nov. 16, 1973, Ser. No. 416,576

Int. Cl. C12g *1/00, 3/00*

U.S. Cl. 426—15 4 Claims

1. A method of upgrading a beverage produced by a fermentation process from a base material including the steps of:

a. fermenting the base material to produce an alcoholic beverage, and off-gases resulting from the fermentation process containing hydrogen sulphide and flavouring and aroma substances,

b. passing the off-gases through a layer of material selected from the group consisting of activated carbon, copper metal particles and copper oxide, that absorbs hydrogen sulphide to purify the gases,

c. passing the purified gases through a bed of activated carbon to load the carbon with flavouring and aroma substances,

d. desorbing the flavouring and aroma substances on the carbon, and

e. adding some of the desorbed flavouring and aroma substances to the beverage.

3,852,478

MILK-CLOTTING ENZYME

David Robert Farr, La Tour-de-Peilz, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Dec. 29, 1972, Ser. No. 319,772

Claims priority, application Switzerland, Jan. 20, 1972, 820/72

Int. Cl. C07g *7/02;* A23c *19/02*

U.S. Cl. 426—42 8 Claims

1. A process for the production by biosynthesis of a milk-clotting agent comprising culturing the microorganism *Physarum polycephalum* under aerobic conditions in an aqueous nutrient medium therefor until a substantial quantity of milk-clotting enzyme having the ability to cleave the phenylalanine-methionine bond of a kappa-casein polypeptide chain is accumulated extracellularly in said medium, and separating said agent comprising said enzyme from said microorganism.

3,852,479

PROCESS FOR PRODUCING A PROTEIN HYDROLYSATE

Tamotsu Yokotsuka, Nagareyama; Takashi Iwaasa, and Mitsuharu Fujii, both of Noda, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Noda-shi, Japan

Continuation-in-part of Ser. No. 102,878, Dec. 30, 1970, abandoned. This application Mar. 27, 1973, Ser. No. 345,455

Int. Cl. A23j *1/14*

U.S. Cl. 426—44 11 Claims

1. A process for producing a protein hydrolysate having a high glutamic acid content, which comprises adding a glutaminase together with a proteolytic enzyme to a salt free denatured protein-containing raw material and hydrolyzing in a closed system the protein contained in the raw material.

3,852,480

BLAND SOY PROTEIN

Wilmore Williams, Chicago, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Apr. 11, 1972, Ser. No. 243,079

Int. Cl. A23j *3/00*

U.S. Cl. 426—46 10 Claims

1. A method of producing a bland soy protein consisting essentially of suspending soy protein in an aqueous medium, adjusting the pH of the resulting suspension to between about 1.5 and 4.0, adding to the suspension an Acid Fungal Protease, allowing the Acid Fungal Protease to act on the suspension at temperatures of from 40°C up to about 55°C until a bland protein is produced, and essentially neutralizing the suspension to adjusting the pH to 6 to 8.

3,852,481

SYNTHETIC GRINDER GAS AROMAS AND PROCESSES

Jacob R. Feldman, New City; Matthew Hamell, Orangeburg, both of N.Y., and Ellen Danielczik, Fort Lee, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 18,296, March 10, 1970, abandoned. This application June 2, 1972, Ser. No. 258,961

Int. Cl. A23l *1/26*

U.S. Cl. 426—65 6 Claims

1. A process for preparing synthetic grinder gas comprising contacting for each one mole of methyl mercaptan a molar excess of carbonyl compounds including 0.6 to 30 moles of acetone, 2 to 50 moles of acetaldehyde, 0.02 to 3 moles of butyraldehyde and 0.2 to 5 moles of a lower alkane α-diketone selected from the group consisting of 2,3-butanedione, 2,3-pentanedione and mixtures thereof to form a reaction mixture and maintaining said reaction mixture for a period of time sufficient to obtain a grinder gas aroma.

3,852,482

PROCESS OF ALTERING THE FLAVOR OF A TOMATO SOUP MIX WITH 2-PHENYL-4-PENTENAL

William Lewis Schreiber, Jackson; Manfred Vock, Locust, both of N.J.; Edward Joseph Shuster, New York, NY, and Alan O. Pittet, Atlantic Highlands, N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

Filed Aug. 25, 1972, Ser. No. 283,651
Int. Cl. A23l *1/26*
U.S. Cl. 426—65 1 Claim

1. A process for altering the organoleptic properties of a tomato soup mix which comprises adding to said tomato soup mix 2-phenyl-4-pentenal and then bringing the resulting mixture to a boil, the amount of 2-phenyl-4-pentenal being in effective amount to impart a fresh tomato character to the soup mix.

3,852,483

INTERMEDIATE MOISTURE FOOD WITH MONOGLYCERIDE AND PROPYLENE GLYCOL PRESERVATIVE

Edward V. Oborsh, Ballwin, Mo., and Robert K. Mohrman, Belleville, Ill., assignors to Ralston Purina Company, St. Louis, Mo.

Continuation of Ser. No. 14,225, Feb. 25, 1970, abandoned. This application Oct. 24, 1972, Ser. No. 299,903
Int. Cl. A23l *1/10, 3/34*
U.S. Cl. 426—94 8 Claims

1. A process for producing an improved, intermediate moisture food product of the low sugar type having a starchy base and having a moisture content of from about 20–35 percent by weight, comprising mixing about 15–60 percent by weight of farinaceous base materials, about 15–60 percent proteinaceous materials, and about 20–35 percent by weight water, and mixing a glyceryl monostearate starch conditioner in proportions of between about 0.25–0.75 percent by weight of the product capable of reacting with the starch to cause the starch to tightly bind water and resist drying and extruding the mixture at high temperature and pressure to form the mixture into particles, adding a propylene glycol preservataive system to the surfaces of the formed particles in proportions of between about 3–8 percent by weight, coating the preserved particles with fat, and heating the fat coated particles.

3,852,484

METHOD OF PRODUCING VEGETABLE PROTEIN SEAFOOD SUBSTITUTES

John M. Cabot, Quincy, Ill., assignor to Central Soya Company, Inc., Fort Wayne, Ind.

Filed Jan. 10, 1972, Ser. No. 216,834
Int. Cl. A23j *3/00*
U.S. Cl. 426—104 9 Claims

1. A method of producing vegetable protein seafood substitutes which comprises:

a. taking an aqueous solution of a vegetable protein essentially free of fibrous residue and other non-proteinaceous materials and adjusting the temperature to less than about 150° F. and the pH to from about 4.5 to about 4.8 whereby the major globulin fractions precipitate as a curd, removing sufficient of said solution from said curd so that the resultant, separated curd has a solids content of from about 15 to about 25 percent by weight;

b. dispersing large particles or agglomerates in said curd;

c. raising the pH of said curd to about 5.5 to about 7.0;

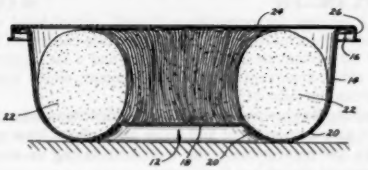
d. heating said curd at the last mentioned pH in an extruder to a temperature of from about 200° to about 300° F. and extruding the heated curd at a pressure of from about 75 to about 200 psi whereby the curd is modified to produce an extrudate having textural properties resembling those of seafood.

3,852,485

PACKAGE FOR UNIFORMLY SHAPED CHIP TYPE SNACK FOOD PRODUCTS

Nelson J. Beall, Albertville, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 159,891, July 6, 1971, abandoned. This application Apr. 19, 1973, Ser. No. 352,811
Int. Cl. B65b *23/00*
U.S. Cl. 426—106 5 Claims



1. A package of uniformly shaped chip-type snack food products, said package comprising a plurality of chips of substantially uniform shape, size, and thickness, each of said chips having major surfaces curved in at least one plane, each of said chips being nested with adjacent chips and having its major surfaces thereof positioned in abutting relationship with major surfaces of other of said chips in intelocking effect to provide a closed loop array having outer and lower exterior edges, a substantially rigid bowl shaped container having a side wall and a bottom wall, said side wall conforming to at least the lower portion of the outer exterior edges of said closed loop array of said chips adjacent thereto, said bottom wall having a portion thereof conforming with at least a portion of the lower edges of said closed loop array, said bottom wall further having means defining a raised portion for holding said chips in said closed loop array and a cover secured along the upper edge of said side wall.

3,852,486

PROCESS OF PRESERVING SHELLFISH MEAT, AND PRODUCT OF SAID PROCESS

Eugene L. Walker, deceased, late of 1833 Ravenwood Dr., Concord, Calif. 94520 (Joan E. Walker, admistratrix), and Antoine R. Ferrandini, deceased, late of 337 Laurel Pl., San Rafael, Calif. 94901 (Suzanne W. Ferrandini, executrix)

Continuation-in-part of Ser. Nos. 615,333, Feb. 13, 1967, abandoned, and Ser. No. 665,959, Sept. 7, 1967, abandoned. This application Nov. 30, 1970, Ser. No. 93,830
Int. Cl. A23b *3/00, 3/01*
U.S. Cl. 426—129 19 Claims

1. A shellfish meat product comprising shellfish meat that has been cooked to a degree such that it is edible and which is in pasteurized condition, said cooked, pasteurized shellfish meat being impregnated with an aqueous solution, said solution being an aqueous solution of (a) a chloride, (b) an antibacterial agent other than said chloride (a), and (c) a strong organic acid capable of producing an aqueous solution of pH less than about 5; said chloride (a) being selected from the group consisting of sodium chloride, potassium chloride and calcium chloride, said antibacterial agent (b) and acid (c) being non-toxic for human consumption; said chloride (a) being present in an amount not less than 2.5 percent; said antibacterial agent being present in amount sufficient to inhibit growth of bacteria in the shellfish meat; said acid (c) being present in sufficient amount to produce a pH of about 5 or less; said impregnated shellfish meat being enclosed in a container which serves to prevent access of ambient organisms and loss of said aqueous solution.

3,852,487
MEAT PASTE PRODUCT AND PROCESS FOR PREPARING SAME

Ferdinand Maria Van Werven, Rhoon, and Frits Peter Bohlmeyer, Berghem, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 67,573, Aug. 27, 1970, abandoned. This application Oct. 10, 1972, Ser. No. 296,459
Claims priority, application Great Britain, Aug. 28, 1969, 42844/69
Int. Cl. A22c *18/00, 25/00*
U.S. Cl. 426—149 **10 Claims**

1. A process for preparing a shaped, consolidated meat product from a meat paste having a moisture content of from about 50 percent to about 80 percent and a fat content of from about 1 percent to about 40 percent, which process comprises the steps of:

i. subdividing raw meat to a finely divided state in the form of an emulsion of fat and water stabilized at least partly by raw meat protein, the raw meat having an average particle size of less than 2 mm;

ii. subdividing cooked meat to provide separated muscle fibre bundles, each fibre bundle being from 2 to 50 mm in length and from 0.5 to 2 mm in diameter;

iii. blending from 30 to 97.5 parts by weight of the finely divided raw meat emulsion and from 2.5 to 70 parts by weight of the separated muscle fibre bundles of cooked meat to provide a meat paste;

iv. extruding said meat paste to form a product wherein the proportion of muscle fibre bundles which are in substantial parallel alignment with each other is from 70 to 100 percent; and

v. consolidating said product by freezing or by heat.

3,852,488
MUSTARD PASTE WHOSE PUNGENCY MAY BE PRESERVED FOR LONG STORAGE AND PROCESS FOR MANUFACTURE THEREOF

Hayashi Yoda, Tokyo, Japan, assignor to S & B Shokuhin Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1972, Ser. No. 277,886
Int. Cl. A23l *1/26*
U.S. Cl. 426—199 **2 Claims**

1. A mustard paste characterized by preservation of its pungency, comprising a paste containing white and black mustard powder, organic acid and other condiments, a member selected from the group consisting of sorbitol and a liquid sweetening agent, and a small quantity of water, said paste having dispersed therein a mixture of an extract of white mustard powder and a distillate of black mustard powder dissolved into fatty oil.

3,852,489
FOOD PRODUCTS AND THE PRESERVATION AND ENHANCING OF THE APPEARANCE THEREOF

Sun W. Yip, Vancouver, British Columbia, Canada, assignor to New England Fish Company, Seattle, Wash.

Continuation-in-part of Ser. No. 348,770, April 6, 1973, abandoned. This application Feb. 22, 1974, Ser. No. 444,992
Int. Cl. A23b *3/00*
U.S. Cl. 426—212 **20 Claims**

1. A process for preserving the reddish color of salmon roe comprising impregnating red colored salmon roe with a non-toxic water soluble citrate or sulfite, in an amount sufficient to maintain the reddish color of said roe.

3,852,490
ORGANIC PESTICIDE RESIDUE REMOVAL FROM AQUEOUS SOLUTIONS

Gustave K. Kohn, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 6, 1973, Ser. No. 338,792
Int. Cl. A23i *1/02*
U.S. Cl. 426—271 **13 Claims**

1. A process for removing organic pesticides selected from chlorinated hydrocarbons, haloalkyl sulfenylated carboximides, haloalkyl sulfenylated phthalimides, benzimidazole carbamates, thioureidobenzenes, oxazolidinediones, hydrocarbyl aryl methylcarbamates or phosphate esters from aqueous solutions containing about 0.01 ppm to 1,000 ppm of said pesticides which comprises contacting said aqueous solution with from 1 to 200 percent by weight, based on weight of aqueous solution, of a C_2-C_4 alkene-vinyl C_2-C_4 alkanoate polymer having a melt index of about 2 to 500 g/10 min., an inherent viscosity of about 0.5 to 1.1, a density of about 0.93 to 0.96 g/cc, and from about 15 to 45 percent by weight based on weight of polymer, of vinyl alkanoate.

3,852,491
HIGH PROTEIN READY-TO-EAT BREAKFAST CEREAL

Wayne Robert Malzahn, Ballwin, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Mar. 22, 1972, Ser. No. 237,166
Int. Cl. A23l *1/18, 1/10*
U.S. Cl. 426—346 **3 Claims**

1. A process for the production of a puffed protein fortified cereal product having a bulk density of between 0.046 g/cc and 0.135 g/cc with a protein content of between about 35 to 60 percent wherein the fortifying protein is uniformly dispersed within the puffed structure of the cereal product thereby improving palatability and rehydration characteristics of the cereal product without a deleterious effect on puffing of the product comprising: forming a dough by the addition of moisture to a mixture of ingredients comprising soy protein isolate and farinaceous ingredients, the amount of added moisture being from about 17 percent to about 30 percent by weight based on the weight of the mixture of ingredients, the amount of soy protein isolate being from about 35 percent to about 60 percent by weight based on the weight of the mixture of ingredients, and the amount of farinaceous ingredients being the substantial remainder of the mixture of ingredients; and extruding the dough at a temperature of between about 225 and 345°F. at a pressure of between 1,000 and 2,200 p.s.i.g. to form a puffed, protein fortified cereal product.

3,852,492
PREPARATION OF HIGH PROTEIN EXPANDED FOOD PRODUCT

Arthur V. Brown, Jr., Fults, Ill., and Edward V. Oborsh, Ballwin, Mo., assignors to Ralston Purina Company, St. Louis, Mo.

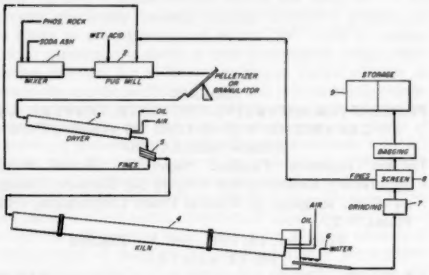
Continuation-in-part of Ser. No. 712,592, March 13, 1968, abandoned. This application Apr. 24, 1972, Ser. No. 247,038
Int. Cl. A23j *3/00*
U.S. Cl. 426—364 **26 Claims**

1. A process for converting one or more of the particulate materials, meat meal, fish meal and poultry by-product meal into an expanded food product comprising the steps of moistening the meal with water to form an extrudable mixture and mixing uniformly therethrough an effective amount of an edible water soluble processing additive selected from the group consisting of amines, amides, ammonium hydroxide and ammonium salts of strong acids, maintaining the mixture at an elevated pressure and at an elevated temperature above 212°F. but below 410°F. for a period of time sufficient to cause the mixture to have an expanded structure as it is finally discharged and extruding the product through a restricted orifice into a zone of substantially lower temperature and pressure to cause flash off of moisture and expansion of the mixture thereby resulting in an expanded food product.

3,852,493
PROCESS FOR DEFLUORINATION OF PHOSPHATE ROCK

Ashok Babubhai Amin, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 10, 1972, Ser. No. 279,586
Int. Cl. C05b *13/00*
U.S. Cl. 426—381 **7 Claims**



1. A process for manufacturing phosphatic materials containing at least 18% P and not more than 0.18% F, comprising: mixing 68–74% BPL phosphate rock, containing 2–6% SiO_2, with water, wet process phosphoric acid and soda ash in sufficient amounts to provide 3.5 to 6 parts by weight of Na_2O and 9 to 15.5 parts by weight of P_2O_5 in the added components per 100 parts by weight of rock and further to provide a Na_2O/P_2O_5 mole ratio in the added components of between 0.70 and 0.95;

granulating said mixture with recycled fines from a later calcination step;

drying said granules and separating fines therefrom;

calcining said dried granules, from which fines have been removed, at a temperature between about 1,315°C. and 1,540°C. in an atmosphere containing about 5 to 30 percent of water vapor;

quenching said calcined granules to a temperature less than 800°C;

crushing and screening said quenched granules;

recycling from about 6 to 30 percent by weight of the fine particles from said crushing and screening step to the granulating step; and

recovering the product from said screening step.

3,852,494
METHODS AND APPARATUS FOR DECORATING CONFECTIONERY ITEMS

Elmer V. Williamson, 7729 Dones Ave., Cincinnati, Ohio 45243

Filed Apr. 30, 1973, Ser. No. 355,515
Int. Cl. A21d *13/08*
U.S. Cl. 426—383 **7 Claims**

1. A method of decorating confectionery items such as cakes, cookies and the like comprising the steps of,

applying a colored lining material to a design stamp having portions delineating a predetermined design,

applying said portions of said design stamp to a confectionery item and transferring colored lining material from said portions to said confectionery item in lines delineating said predetermined design,

removing said stamp from said confectionery item and leaving the said predetermined design on the surface of said confectionery item, and

applying colored fill material to complete said design by coloring and decorating said design within said lines.

3,852,495
PREPARATION OF A LOW ALCOHOL DIETARY BEER

Franz-Wilhelm Schimpf, Hamburg, and Wilfried Rinke, Halstenbeck, Holstein, both of Germany, assignors to Aktiengesellschaft fur Brauerei-Industrie, Basel, Switzerland

Continuation of Ser. No. 105,058, Jan. 8, 1971, abandoned. This application Aug. 17, 1973, Ser. No. 389,170
Claims priority, application Switzerland, Oct. 7, 1970, 15011/70
Int. Cl. C12c *11/00*
U.S. Cl. 426—14 **12 Claims**

1. A process for producing a dietary beer having a low-alcohol content, a low-carbohydrate content and a low-calorie value comprising:

a. allowing a mixture containing wort, hops and yeast to partially ferment in a first fermentation step at a temperature of about 4° to 8°C for 2 to 5 days to an apparent degree of fermentation of about 40 to 85 percent;

b. reducing the content of alcohol in the partially fermented mixture to about 1 percent by boiling;

c. filtering the partially fermented mixture;

d. adding fresh yeast to the partially fermented mixture;

e. allowing the partially fermented mixture to continue to ferment in a second fermentation step at a temperature of about 12° to 20°C for 7 to 10 days;

f. clarifying the partially fermented mixture after the second fermentation step has begun;

g. adding about 5 volume percent of a solution of diastase having a high content of marginal dextrinase which acts on alpha-1,6 marginal dextrin to the partially fermented clarified mixture;

h. allowing the clarified mixture to age; and

i. clarifying the fermented mixture.

3,852,496
TREATMENT OF WHEY WITH IMMOBILIZED LACTASE AND GLUCOSE ISOMERASE

Howard H. Weetall, Elmira, and Sidney Yaverbaum, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sept. 4, 1973, Ser. No. 394,294
Int. Cl. C07g *7/02*
U.S. Cl. 426—41 **4 Claims**

1. A method of treating a solution of whey containing lactose to produce useful sweeteners which comprises the steps of reacting the solution with a composite comprising beta-galactosidase covalently bonded to a high surface area, porous glass material through an intermediate silane coupling agent to hydrolyze a portion of the lactose to glucose and galactose; removing the majority of the calcium ions from the solution; adjusting the pH of the solution above 7.0; and then reacting the solution with a composite comprising glucose isomerase covalently bonded to a high surface area, porous glass material through an intermediate silane coupling agent to isomerize a portion of the glucose to fructose.

3,852,497

CEREAL PRODUCTS CONTAINING MAGNESIUM COMPOUNDS AS NUTRITIONAL SUPPLEMENTS

James S. Skelcey; David W. Richards, and Alan M. Hart, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 5, 1973, Ser. No. 337,862
Int. Cl. A23l *1/30;* A21d *2/02*
U.S. Cl. 426—74 7 Claims

1. A cereal-containing foodstuff which is fortified with about 0.02 to about 0.5 weight percent, cereal basis, of a magnesium compound in particulate form selected from the group consisting of (1) magnesium oxide calcined at about 700°C. to about 1,700°C.; (2) magnesium phosphate, magnesium potassium phosphate, magnesium pyrophosphate, magnesium hydrogen phosphate and hydrates thereof; and (3) mixtures thereof.

3,852,498

METHOD FOR SORPTION OF UREA BY WHOLE CEREAL GRAINS

Harold N. Barham, 3205 46th St., and Harold N. Barham, Jr., 3035 57th St., both of Lubbock, Tex. 79413

Filed Oct. 19, 1972, Ser. No. 298,820
Int. Cl. A23k *1/22*
U.S. Cl. 426—69 5 Claims

1. A method for supplementing the natural protein content of whole feed grains to produce a grain having a total equivalent protein content up to about 58 percent which comprises:
a. contacting the raw whole feed grains with water to provide a moisture content in the grain from about 14 to 25 percent by weight;
b. contacting the treated grain of step (a) with urea in amounts up to about 20 percent based on the dry grain weight, the particles of urea being smaller than about 450 microns by at least two dimensions; and
c. maintaining contact of urea and whole grain until the urea has been sorbed by the grain;
whereby a whole grain product is produced capable of being converted by the animal's digestive system to provide up to 58 percent protein based on the original dry grain weight.

3,852,499

RESIN ACID MODIFIED OILSEED MEAL

Frances A. Greer, Grayslake, Ill., assignor to International Minerals & Chemical Corporation, Libertyville, Ill.

Filed Nov. 28, 1969, Ser. No. 880,916
Int. Cl. A23k *1/10;* A23l *1/36*
U.S. Cl. 426—93 14 Claims

1. An animal nutrient consisting essentially of an oilseed meal having substantially evenly distributed on its surface an effective amount of a material selected from the group consisting of resin acids, hydrogenated resin acids, dehydrogenated resin acids, dimerized resin acids, mixtures of said compounds and divalent metal salts thereof, whereby the meal is protected from attack by microorganisms.

3,852,500

PRESERVATION OF CRAWFISH MEAT WITH HEPATO-ANCREATIC CRAWFISH DISTILLATE

Aubrey C. Heumann, Jr., Breaux Bridge; Wayne L. Denton, and Jimmie D. Fitzpatrick, both of Lafayette, all of La., assignors to Mr. Crawfish, Inc.

Filed Apr. 23, 1973, Ser. No. 353,736
Int. Cl. A29c *29/00;* A23p *3/34*
U.S. Cl. 426—151 9 Claims

1. A method of preserving crawfish meat comprising:
separating the hepato-pancreatic tissue from the crawfish;
heating the hepato-pancreatic tissue to a temperature ranging from about 60°C. to about 100°C. under a pressure which causes continuous distillation;
collecting from about 50 to about 70 parts by weight of distillate material based on 100 parts of initial charge of hepato-pancreatic tissue; and
treating the uncooked crustacean meat with at least 5 ml. of said distillate per pound of meat to help preserve the meat under low temperature storage.

3,852,501

PROCESS FOR IMPARTING THE TASTE, TEXTURE, AND APPEARANCE OF FAT FRYING TO FOODSTUFFS WHICH ARE BAKED

Thomas Laurence Fazzina, Naperville; Daniel Robert McSweeney, Lombard, and Gregory Jay Gilmore, Chicago, all of Ill., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 15, 1971, Ser. No. 208,390
Int. Cl. A22c *18/00*
U.S. Cl. 426—293 3 Claims

1. A process for imparting the taste, texture, and appearance of fat frying to foodstuffs which are baked, comprising, moistening the surface of a foodstuff, coating the moistened foodstuff with a dry, edible mix consisting essentially of 10–50 percent of an edible powdered shortening, 8–35 percent farinaceous material, 15–35 percent of a corn starch hydrolyzate, and 5–18 percent of a modified food starch, at least some of which food starch is ungelatinized, and baking said coated foodstuff until cooked.

3,852,502

THE METHOD OF STABILIZING FOODS WITH AN ANTIOXIDANT

Solomon J. Bishov, and Albert S. Henick, both of Framingham, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 9, 1973, Ser. No. 349,588
Int. Cl. A23l *3/34*
U.S. Cl. 426—328 2 Claims

1. A process for the stabilization against oxidation of oxidation susceptible foods, which comprises adding thereto an antioxidative amount of an antioxidant composition comprising (a) a compound selected from the group consisting of butylated hydroxyanisole, butylated hydroxytoluene, and α-tocopherol, and (b) autolyzed yeast protein, said autolyzed yeast protein being present in said antioxidant composition in an amount which is effective as a synergist for the antioxidant action of said compound selected from the group consisting of butylated hydroxyanisole, butylated hydroxytoluene, and α-tocopherol.

3,852,503

METHOD OF MAKING PUDDINGS CONTAINING SOY PROTEIN

Pete Joseph Magnino, St. Louis; Ralph Anthony Hoer, Ballwin, both of Mo., and Robert Erick Hahn, Edwardsville, Ill., assignors to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 219,156, Jan. 19, 1972,. This application Jan. 10, 1973, Ser. No. 322,461
Int. Cl. A23j *3/00;* A23l *1/14*
U.S. Cl. 426—364 6 Claims

1. A process of forming a pudding which has a pH less than about 4.2 containing isolated soy protein comprising the steps

of: (*a*) preparing isolated soy protein consisting of the steps of extracting protein and sugars from solvent extracted soybean material, separating the extracted liquor from the solid soybean material, adjusting the pH of the liquor to about the isoelectric point of the protein to precipitate the protein, and separating the precipitated protein from the residue of any remaining sugars and solid soybean material to obtain the isolated soy protein; and (*b*) thereafter forming an aqueous slurry of the isolated soy protein having a pH of about 2.0 to about 4.2 and a solids content within the range of 3 – 20 percent; practically instantly heating successive portions of the slurry to a temperature of about 250° – 320° F., subsequently retaining the slurry at said temperature range under positive pressure for at least a sufficient period of time to destroy the trypsin inhibitor therein and then suddenly releasing the pressure thereon, such sudden pressure release causing flash off volatilization and cooling of the aqueous slurry of isolated soy protein; and (c) blending approximately 1.0 – 4.5 percent on a dry weight basis of the isolated soy protein with a mixture of pudding ingredients, the blended mixture having a moisture content of approximately 65 – 70 percent, a pH less than about 4.2 and a starch content of approximately 3.5 – 7 percent on a dry weight basis, heating the blended mixture to a temperature of about 240° F. to about 320° F. for approximately 45 seconds to 3 seconds, and thereafter cooling the blended mixture to below 100° F. to form a pudding.

3,852,504

PROCESS FOR COMPLETE SEPARATION OF CONSTITUENTS OF RICE-BRAN AND THE LIKE

Shigetoshi Mihara; Yanosuke Inaba, both of Tokyo; Koichi Tachibana; Tomio Endo, both of Saitama, and Eiichiro Yasui, Urawa, all of Japan, assignors to Nakataki Pharm. Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 26,089, April 6, 1970, abandoned. This application Sept. 5, 1972, Ser. No. 286,602
Claims priority, application Japan, Apr. 9, 1969, 44-27363
Int. Cl. A23j *1/14*
U.S. Cl. 426—373 **7 Claims**

1. A process for separating and recovering the constituents of a starting material consisting of non-deoiled seeds or brans of cereal grains, said starting material containing the naturally occurring amount of oil of said seeds or bran together with protein, crude fiber, starch, Phytin, water soluble carbohydrates and water, which consists of the steps of

1. mixing said starting material with an aqeuous acid solution having a pH in the range of from 1 to 6, the amount of said aqueous acid solution being from two to 10 times by weight, of the starting material, and mechanically pulverizing the mixture consisting of said starting material and said aqueous acid solution to obtain a pulverized mixture of components consisting essentially of
   a. a solid phase consisting essentially of large size crude fibers and small size starch particles
   b. a liquid phase consisting essentially of
      i. protein bonded with oil, emulsified in
      ii. an aqueous phase containing dissolved therein Phytin and water soluble carbohydrates;
2. separating from the mixture and recovering separately the large size crude fibers and small size starch particles;
3. filtering component (b) and recovering separately constituents (i) and (ii);
4. then treating constituent (i) with a solvent to recover separately said protein and said oil, and
5. adjusting the pH of constituent (ii) in the range of 8 to 10 to precipitate Phytin and then separating the precipitated Phytin from the aqueous solution containing dissolved therein the water soluble carbohydrates.

3,852,505

PROCESS FOR PREPARING SHRIMP

Leon Rubin, New York, N.Y., assignor to Atlantic Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 153,877, June 16, 1971, abandoned. This application Aug. 21, 1973, Ser. No. 390,195
Int. Cl. A23l *1/325*
U.S. Cl. 426—370 **3 Claims**

1. A process for preparing molded shrimp from very small shrimp with or without fragments of larger shrimp which consists in subjecting very small decapitated and deshelled refrigerated shrimp to tempering until they rise from a chilled temperature of between −5° and 0°F to a temperature of about 20° to 30°F, passing the tempered shrimp through a one-eighth inch aperture to effect braying, thereby placing said shrimp in a smooth moist condition for subsequent treatment, agitating the thus treated shrimp for 5 minutes at 85 to 125 rpm, discomposing the thus agitated shrimp to effect trituration, fluttering the triturated shrimp for 2 – 3 minutes at 40° to 55°F and then subjecting the same to molding at high pressure of 50 to 150 psi and low temperature of below 32°F and down to −300°F to produce a form closely resembling natural shrimp and which does not disintegrate or break up into small pieces.

3,852,506

DISPERSIBLE IMPROVED WHEY PROTEIN COMPOSITION AND METHOD

Roger M. Burge, Battle Creek, Mich.; Charles W. Groesbeck, Seymour, Conn., and Diane D. Dowd, Madison, Wis., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 21, 1973, Ser. No. 362,149
Int. Cl. A23c *21/00*
U.S. Cl. 426—453 **1 Claim**

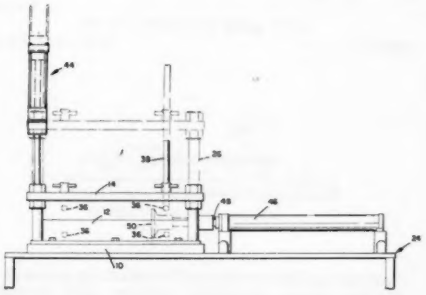
1. A process for making dried whey protein which comprises finely grinding hollow spheres of spray dried demineralized and delactosed whey protein isolates to a particle size wherein at least 55 percent of the subdivided particles have a micron size of less than 44 microns, and thence agglomerating the subdivided particles thereof.

3,852,507

SURFACE FREEZING A SHAPED PIECE OF MEAT

Daniel J. Toby, South San Francisco, Calif., assignor to Toby Enterprises, South San Francisco, Calif.

Filed May 25, 1972, Ser. No. 257,020
Int. Cl. A23b *1/06*
U.S. Cl. 426—513 **3 Claims**



1. The method of forming an irregular mass of a meat into an elongated and at least partially frozen piece having a sub-

stantially uniform cross-sectional shape throughout the length of its elongation, which comprises the steps of: placing and supporting said irregular mass of meat on a longitudinally extending hollow lower die member, having an upwardly opening channel of uniform transverse cross-sectional configuration throughout its length corresponding to approximately one-half of the desired cross-sectional shape of said elongated piece to be produced; relatively moving a longitudinally extending hollow upper die member, having a downwardly opening channel of uniform transverse cross-sectional configuration throughout its length corresponding to approximately the other one-half of the desired cross-sectional shape of said elongated piece to be produced, into contact with said lower die member, and forming an elongated tubular chamber portion with opposite open ends and of uniform transverse cross-section throughout its length corresponding to the cross-sectional shape of said elongated piece to be produced with the mass of meat within said chamber; closing one of said ends of said chamber; forcing the head at the distal end of a piston, having a transverse cross-sectional configuration corresponding to the transverse cross-sectional configuration of said chamber, into the other of said ends and along said chamber toward said one end, and simultaneously forming said mass into said desired cross-sectional shape of said elongated piece; circulating refrigerant through said hollow dies to effect a cooling of said dies to substantially below the freezing temperature of said formed meat and freezing at least the surface of the formed meat in contact with said dies; and removing the elongated and at least partially frozen formed meat from said dies by first opening said one end of said chamber, and then further moving said head along the length of said chamber toward said one end to force said at least partially frozen elongated formed meat through said opened one end and from between the dies.

3,852,508

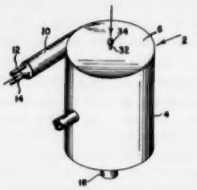
STEAM CONDENSER FOR RETORT AND METHOD

John M. De Voe, Nashville, Tenn., assignor to United States Tobacco Company, Greenwich, Conn.

Filed Feb. 9, 1973, Ser. No. 331,259

Int. Cl. B05b *7/10*; **A23l** *3/00*

U.S. Cl. 426—521 **11 Claims**



1. A method of discharging steam from a retort of the type which is used in canning foods, the steps of, passing a stream of the steam from the retort through a restricting passageway, expanding the stream of steam from said passageway into a manifold chamber of substantially increased cross-sectional area whereby there is a reduction in the velocity and pressure and temperature, discharging the stream of steam longitudinally from said manifold chamber into the upper portion of a condensing zone with a tangential flow which tends to produce a cyclonic action within said zone, spraying water throughout the portion of said zone within which the steam is discharged from said manifold chamber and elsewhere within said zone to condense the steam and produce condensate in the water, and discharging the water and condensate with the aid of gravity.

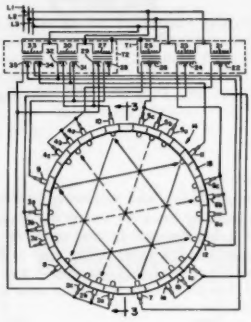
ELECTRICAL

3,852,509

ELECTRICAL FURNACE FOR MELTING THERMOPLASTIC MATERIAL

Heath A. Rutledge; Myron A. Smith, and Paul F. Spremulli, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,853
Int. Cl. C03b 5/02
U.S. Cl. 13—6 8 Claims



1. A furnace for electrically heating thermoplastic material comprising:

a. a bottom wall and an upstanding peripheral wall symmetric about a center-line, with said bottom and peripheral walls defining a chamber for containing a body of thermoplastic material to be melted;

b. a first set of six equidistantly spaced means for providing, through said thermoplastic material, at least three cross-firing current paths intersecting in the vicinity of said center-line;

c. a second set of six electrode means for providing, through said thermoplastic material, intraphase peripheral-firing current paths, being symmetric about said center-line; and

d. supply circuit means for transmitting alternating electrical current to said first and second set electrode means, including

1. a supply of polyphase electrical power;

2. first and second sets of voltage sources fed by said supply, with said first voltage source set furnishing intraphase voltages of respectively equal magnitude and relative phases represented by voltage vectors corresponding at least approximately to lines joining said first set electrode means and with said second voltage source set furnishing intraphase voltages of respectively equal magnitude and relative phases represented by voltage vectors corresponding at least approximately to lines joining said second set electrode means; and

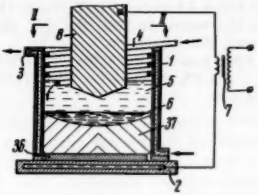
3. conductor means for connecting said first and second sets of voltage sources respectively to said first and second sets of electrode means to apply voltages of respectively equal magnitudes across said at least three cross-firing paths, to apply voltages of respectively equal magnitudes across said symmetric peripheral-firing paths, and voltages of respectively equal magnitudes between all corresponding pairs of electrode means not connected by said intraphase cross-firing and peripheral-firing current paths.

3,852,510

METHOD OF ELECTROSLAG REMELTING AND DEVICE EFFECTING

Boris Evgenievich Paton, ulitsa Kotsjubinskova, 5, kv. 21; Boris Izhailevich Thedovar, bulvar Lesi Ukrainki, 2, kv. 6; Jury Vadimovich Latash, Vozdukhoflotsky prospekt, 81, kv. 14; Leonty Vasilievich Chekotilo, ulitsa Scharbakova, 49a, kv. 10; July Georgievich Emelyanenko, ulitsa Darvina, 5, kv. 5; Vasily Ivandvich Us, ulitsa Saxaganskogo, 58, kv. 12; Vitaly Mikhailovich Baglai, ulitsa Semashko, 10, kv. 54/3; Viktor Mikhailovich Martyn, ulitsa Vernadskogo, 65, kv. 102; Viktor Leonidovich Artamonov, ulitsa Sovskaya, 9, kv. 4; Oleg Petrovich Bondarenko, ulitsa Kreschatik, 15, kv. 34; Georgy Alexandrovich Boiko, ulitsa Vl, Libedskaya, 16, kv. 106; Anatoly Konstantinovich Isikulenko, ulitsa Babushkina, 23, kv. 38; Vasily Vladimirovich Ivon, Darnitskoe shosse, 107/2, kv. 10, and Leonid Viktorovich Pavlov, Borschagouskaya ulitsa, 234, kv. 6, all of Kiev, U.S.S.R.

Continuation of Ser. No. 339,068, March 8, 1973, abandoned, Division of Ser. No. 125,744, March 18, 1971, Pat. No. 3,767,294. This application Dec. 17, 1973, Ser. No. 425,550
Int. Cl. H05b 7/06
U.S. Cl. 13—18 2 Claims



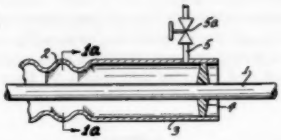
1. A consumable electrode for use with a mold for effecting electroslag remelting, comprising a massive rod and a nozzle for blowing agents into the melt in the mold for improving the quality of the ingot, the nozzle being a coil wound around said rod and made of the same material as the rod.

3,852,511

GAS INSULATED HIGH VOLTAGE CABLE

Jan Artbauer, Langenhagen, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed July 5, 1973, Ser. No. 376,521
Claims priority, application Germany, July 6, 1972, 2233217
Int. Cl. H01b 9/06; H02g 15/24
U.S. Cl. 174—11 R 6 Claims



1. In a long, gas insulated high voltage cable comprising: relatively long, reelable, individually sealed and self-contained sections, each section being filled with insulative gas and being at least as long so as to permit winding in several turns on a drum;

each section having (a) an inner conductor, (*b*) an outer conductor constructed as a metal strip with edges and bent around the inner conductor in concentric relation thereto to establish a tubular configuration and having a welding seam along the strip edges for sealing the space between the tubularly bent strip and the inner conductor, the bent strip with welding seam being corrugated and constituting a corrugated tube, each section further having (c) a first and a second sleeve respectively secured in gas tight and sealed relation to or integral with opposite ends of the bent, welded and corrugated strip as constituting said tube, (*d*) a first and a second washer respectively in said sleeves, the washers being made of insulating material and being respectively sealingly traversed by the inner conductor or by a closed-surface extension thereof, thereby sealing the interior of the section to which they pertain; and (e) means on at least one of the sleeves of each section for providing a fluid inlet and outlet on the side of the respective washer facing the interior of said tube;

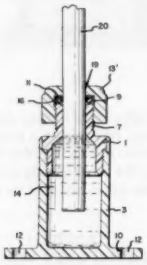
said gas filled sections being interconnected by means of one each of their respective sleeves as adjoining the sections having been prefilled prior to interconnection of two sections through their respective adjoining sleeves.

3,852,512

HIGH VOLTAGE CORONA-FREE WIRE TERMINATION

Henry Otto Herrmann, Jr., Mt. Joy, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 15, 1973, Ser. No. 370,578
Int. Cl. H02g *15/06;* **G01** *31/20*
U.S. Cl. 174—19 **6 Claims**



1. An electrical conductor subjected to a high voltage having a termination comprising,

a hollow enclosure formed of an electrically insulating material, said enclosure including an aperture through its wall,

an electrically insulating liquid filling at least a portion of said enclosure,

closure means for said aperture mounted on said enclosure about the aperture,

said conductor passing through the closure means, extending through the aperture and terminating within the liquid, said closure means including an O-ring seated on the rim of said aperture and means to force said O-ring against said rim and said conductor.

3,852,513

ELECTRICAL WIRING SYSTEM

Richard G. Flahive, 2665 Balboa Vista, San Diego, Calif. 92105

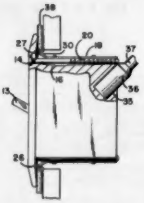
Filed Jan. 9, 1973, Ser. No. 322,138
Int. Cl. H02g *3/12*
U.S. Cl. 174—55 **2 Claims**

1. An electrical outlet device comprising:

a hollow body member having an electrical device disposed therein and a peripheral flange extending laterally from the face thereof to define a face plate;

a pair of locking plates, slidably disposed on opposite sides of said body;

means extending through the said face plate to cause transverse movement of said slideably locking plates;



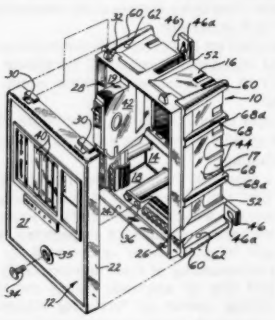
means mountable to a wall and being formed with an aperture defined by inwardly extending flanges, said body member being disposed in said aperture whereby, upon movement of said locking plates, said locking plates and the outer flanges of said face plate grip said inwardly directed flanges to thereby mount said electrical outlet device on said wall.

3,852,514

NON-METALLIC LOAD CENTER HAVING HOUSING ACCOMMODATING PLURAL COVER FORMS

Robert W. Lauben, Farmington, Conn., assignor to General Electric Company, New York, N.Y.

Filed June 14, 1973, Ser. No. 369,868
Int. Cl. H05k *5/03*
U.S. Cl. 174—58 **6 Claims**



1. A non-metallic enclosure for electrical equipment comprising, in combination:

A. a molded, electrically insulative housing including a backwall and integrally formed, upstanding sidewalls, said sidewalls terminating in a perimetrical lip circumscribing the open front of said housing;

B. first mounting means integrally formed with said housing externally of said sidewalls facilitating the mounting of said enclosure to the surface of a wall;

C. second mounting means integrally formed with said housing externally of said sidewalls facilitating mounting of said housing to a wall stud in recessed relation to the wall surface;

D. a molded insulative cover for said housing, said cover including a rectangular front wall and an integrally formed, perimetrical flange depending from said front wall, said flange telescopically interfitting with said lip in closure relation to the open front thereof;

E. first attachment means integrally formed with said housing facilitating attachment of said cover to said housing when mounted to a wall surface; and

F. second attachment means integrally formed with said housing facilitating attachment of said cover to said housing when mounted in recessed relation to a wall surface.

3,852,515

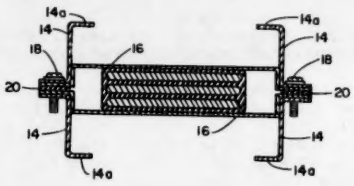
WEATHERPROOF BUS DUCT HOUSING

George N. Jorgensen, and Frank J. Wartner, both of Oxford, Ohio, assignors to Square D Company, Park Ridge, Ill.

Continuation of Ser. No. 77,821, Oct. 5, 1970, abandoned. This application Sept. 21, 1973, Ser. No. 399,585

Int. Cl. H02g *5/06*

U.S. Cl. 174—68 C **4 Claims**



1. A bus duct housing comprising a pair of elongated outwardly flanged channel members in reversely positioned relationship to each other, each flange of one channel member being secured to a flange of the other channel member, means at each pair of secured-together flanges providing a pair of elongated generally Z-shaped auxiliary housing members reversely positioned with respect to each other and secured to the pair of secured-together flanges with free end positions pointing toward the other pair of generally Z-shaped auxiliary housing members secured to the other pair of secured-together flanges, the flanges of the channel members and corresponding portions of the generally Z-shaped auxiliary housing members being cut away at opposite ends of the housing and on opposite sides thereof to provide four flat surface areas, and four end plate members secured respectively to the flat surface areas.

3,852,516

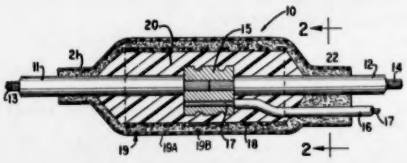
MOISTURE PROOF SPLICE ENCLOSURE FOR ELECTRICAL APPLICATION

Cornelius J. Vander Ploog, Pompton Plains, N.J.; Arnold W. Henry, Pomona, N.Y., and Franklin J. Connolly, Sparta, N.J., assignors to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed May 2, 1973, Ser. No. 356,281

Int. Cl. H02g *15/08*

U.S. Cl. 174—71 R **6 Claims**



1. A sealed connection of electrical cables comprising means connecting the ends of the conductors of the cables, a rigid plastic tubular member positioned over said connecting means and cable ends and having a diameter larger than the diameter of said connection means to define a space between said cables and said tubular member, a thermoset electrically insulating material within such space and enclosing said tubular member, and a cover of electrically insulating material enclosing said thermoset material and extending beyond the ends of said tubular member, the cover ends being brought together over the cables and sealed to form a moisture-proof connection.

3,852,517

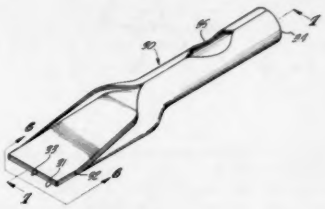
CONDUCTIVE INSERT FOR HEAT RECOVERABLE ELECTRICAL CONNECTOR

Donald A. Del Fava, Fremont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed June 12, 1972, Ser. No. 262,084

Int. Cl. H02g *15/08*

U.S. Cl. 174—84 R **1 Claim**



1. A connector including a conductive insert disposed within a heat recoverable member for forming an electrical and mechanical connection between conductors, said insert comprising; a heat recoverable member having disposed therein an elongated layer of a conductive material, each end of said layer having an inner surface for receiving a conductor; and

a layer of electrically conductive solder means disposed on at least a portion of one of said inner surfaces of said conductive elongated layer, recovery of the heat recoverable member after positioning at least one conductor proximate to each of said inner surfaces resulting in the melting of said solder means and in the electrical and mechanical connection between the conductors, said insert being adapted to connect a flat conductor to a round conductor wherein one end of said layer of conductive material is formed into a cylindrical shape having a viewing port located in the side thereof and the other end of said layer of conductive material being formed into a generally flat shape.

3,852,518

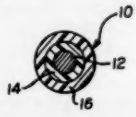
IRRADIATION CROSS-LINKED COMPOSITE LOW DENSITY/HIGH DENSITY POLYETHYLENE INSULATED 600 VOLT POWER CABLES

Bernard Wargotz, Middletown, and David A. Silver, Livingston, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Nov. 29, 1973, Ser. No. 419,949

Int. Cl. H01b *7/28*

U.S. Cl. 174—120 SR **8 Claims**



1. A power cable comprising a conductor core, a composite insulation surrounding the core and comprising an inner layer

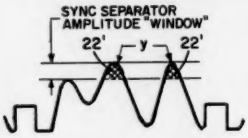
of insulation made of cross-linked low density polyethylene, and an outer insulation applied over the inner insulation to give the cable improved impact, score and abrasion resistance, the outer insulation being cross-linked high density polyethylene.

3,852,519

VIDEO AND AUDIO ENCODING/DECODING SYSTEM EMPLOYING SUPPRESSED CARRIER MODULATION

Patrick R. J. Court, Los Angeles, Calif., assignor to Optical Systems Corporation, Los Angeles, Calif.

Filed Oct. 20, 1972, Ser. No. 299,436
Int. Cl. H04n *1/44*
U.S. Cl. 178—5.1 **32 Claims**



1. In a television communication system, a method of encoding a transmission to prevent a television program signal from being intelligibly received by an unauthorized television receiver, and for maintaining said television program signal recoverable by an authorized receiver, said television program signal being comprised of a video carrier amplitude modulated by a video signal, said television program signal being comprised of a video carrier amplitude modulated by a video signal, said modulated video carrier being combined with a frequency modulated audio carrier, said method being comprised of suppressing said modulated video carrier of said television program signal by a factor sufficient for at least portions of said modulated video carrier to be reduced below normal peak level at least part of the time, thus producing a suppressed video carrier whereby intelligible reception of said television program signal by an unauthorized receiver is prevented, wherein suppression of said modulated video carrier is sufficient during at least portions thereof to prevent satisfactory intercarrier demodulation of said frequency modulated audio carrier by an unauthorized receiver, whereby intelligible reception of the audio portion of said television program signal is prevented, and wherein suppression of said modulated vido carrier is to such an extent that proper line synchronization of an unauthorized receiver fails sufficiently for display of an intelligible picture to become impossible due to peak inverted video signals having an amplitude more than that of synchronizing pulses amplitude modulated on said video carrier.

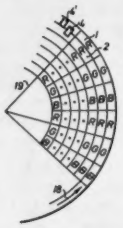
3,852,520

COLOR VIDEO SIGNAL STORE

Walter Bruch, Hannover, Germany, assignor to Ted-Bild-platten Aktiengesellschaft AEG-Telefunken-Teldec, Zug, Switzerland

Filed Aug. 25, 1971, Ser. No. 174,735
Claims priority, application Germany, Aug. 27, 1970, P 20 42 434.4; July 10, 1971, P 21 34 556.2
Int. Cl. H04n *5/78, 9/32*
U.S. Cl. 178—5.4 CD **25 Claims**

1. In a recording system for recording color video signals including means for recording the color video signals along a track on a storage medium in a manner whereby track sections which are assigned to spatially identical points of successive frames lie next to one another on said storage medium, the improvement comprising: means, connected to said recording means, for converting at least one selected parameter of the modulated chrominance subcarrier to be



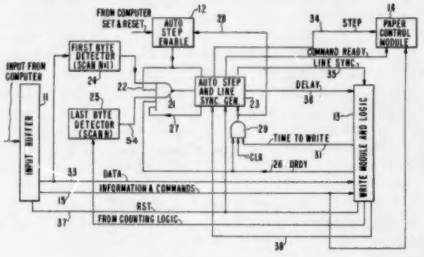
recorded so that identical color signals with respect to the selected parameters are recorded on adjacent track sections.

3,852,521

INTERFACE FOR COMPUTER AND PRINT OUT SYSTEM FOR AUTOMATIC STEP AND LINE SYNC COMMAND TO PRINTER

Arthur E. Bliss, Sunnyvale, and Philip C. Kenny, Los Altos, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Dec. 26, 1972, Ser. No. 318,289
Int. Cl. H04n *5/06;* **G11b** *13/00;* **G06f** *3/12*
U.S. Cl. 178—5 **10 Claims**



1. The method for feeding data from a data source to a data print out system including a stepping printer wherein said data is in the form of a plurality of raster scans, each raster scan comprising a plurality of bytes, each byte containing a plurality of bits, each raster scan providing the data print out in a separate line of the print out medium, comprising the steps of detecting the print out of the last byte of raster scan n,

detecting the receipt of the first byte of raster scan $n + 1$ from said source,

and producing a step command and line synchronize signal to the print out system to step the printer line-by-line for each raster scan and to synchronize the initiation of the line printing with the start of each raster scan in response to said two byte detections.

3,852,522

VARIABLE Q IF AMPLIFIER

James C. Martin, Fort Wayne, Ind., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed May 21, 1973, Ser. No. 362,385
Int. Cl. H04m *5/48*
U.S. Cl. 178—5.8 R **8 Claims**

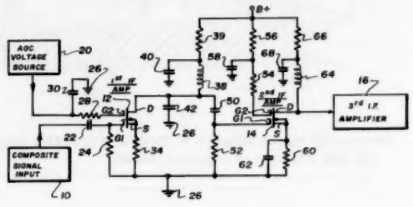
1. In a television receiver including an intermediate frequency amplifier for amplifying a modulated sound carrier

and a modulated video carrier, and an automatic gain control stage for generating an AGC signal representative of the strength of a received television signal, the improvement comprising:

a field-effect transistor having a gate, a source, and a drain;

a tuned network coupled to said drain for passing an amplified IF signal;

an unbypassed source resistor coupled to said source for generating negative voltage feedback to vary the output



impedance at the drain in response to signal changes at the gate;

composite signal input means for varying the current flow between the drain and source in response to the received television signal; and

AGC input means for coupling the AGC signal to said gate to vary the output impedance of said field-effect transistor in response to changes in the AGC signal, whereby changes in the output impedance change the Q of the tuned network.

3,852,523

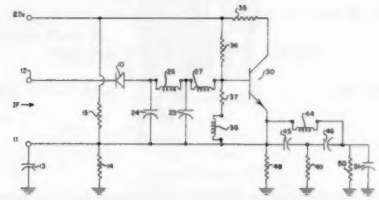
CIRCUIT FOR COLOR TELEVISION RECEIVERS

John G. Humphrey, Chesapeake, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Apr. 9, 1973, Ser. No. 349,619

Int. Cl. H04n *5/62*

U.S. Cl. 178—5.8 A **3 Claims**



1. In a color television receiver having a video detector circuit for producing a demodulated signal by demodulating an intermediate frequency signal applied to said detector, said intermediate frequency signal comprising a relatively wide-band video signal and an audio signal and said demodulated signal containing a luminance signal, a chrominance signal and a difference signal having a frequency which is the difference between the intermediate frequency of said video signal and the intermediate frequency of said audio signal, an improved video signal circuit comprising:

an emitter follower circuit connected to receive said demodulated signals; and

a trap circuit for trapping said difference signal at the emitter of said emitter follower circuit wherein the output of said trap circuit is connected to a load, said load, as seen by the output of said trap, being adjustable to emphasize a relatively narrow band of preselected video signal frequencies less than the frequency of said difference signal.

3,852,524

STEREOSCOPIC TELEVISION SYSTEM

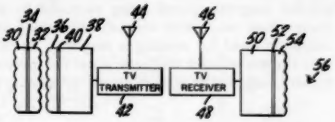
Shigeru Ando, and Takayuki Miyazawa, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyoda-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 843,374, July 22, 1969, abandoned. This application Feb. 9, 1972, Ser. No. 224,730

Claims priority, application Japan, July 22, 1968, 43-51772

Int. Cl. H04n *9/54*

U.S. Cl. 178—6.5 **9 Claims**



1. In a television system for producing three dimensional vision, a television transmitter unit comprising a first focussing optical means of fly's eye type comprising an array of a multiplicity of small plano-convex spherical lens elements closely disposed in columns and rows in a plane and directly viewing an object to be televised to produce a two dimensional array of images of said object differing progressively with their position in the array, a second focussing optical means of fly's eye type of like construction disposed in back-to-back relationship with said first optical means so as to have a focal plane common to said first and second optical means, a light transmissive optical diffusion sheet sandwiched between said first focussing optical means and said second focussing optical means in said common focal plane so that each of the small spherical lens elements forming said second optical means produces an image of the image produced by the corresponding small spherical lens element of said first optical means on said light transmissive optical diffusion sheet, a third focussing optical means of fly's eye type of like construction disposed in spaced relationship to said second optical means with the convex faces of said second and third optical means facing one another so that the array of images produced by said second optical means as viewed through said third optical means forms an array of images of the object in the focal plane of said third optical means, pick-up tube means comprising a photosensitive layer disposed at the focal plane of said third focussing optical means to receive an optical image formed thereon by said third focussing optical means and means to provide a corresponding electrical signal, and transmitter means for processing and transmitting said electrical signal from said pick-up tube means.

3,852,525

MAGNETIC FACSIMILE AND READ-OUT DEVICE FOR ORIGINAL

Satoshi Ichioka, Toda; Kazuo Onishi, Tokyo; Tadashi Inoue, Tokyo; Hirohisa Ono, Tokyo, and Shinjiro Takeuchi, Toda, all of Japan, assignors to Mishima Kosan Co. Ltd., Kitakyushu-city, Fukuoka Prefecture, Japan

Filed Nov. 24, 1972, Ser. No. 308,944

Claims priority, application Japan, Dec. 9, 1971, 46-99076

Int. Cl. H04n *1/28*

U.S. Cl. 178—6.61 **1 Claim**

1. A magnetic facsimile, comprising:

means for receiving a record medium, first magnetic signals being previously recorded upon said record medium;

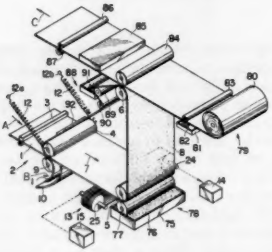
magnetizing means positioned adjacent said receiving means for magnetizing the first magnetic signals on said record medium;

an endless transfer magnetic sheet for receiving the first magnetic signals from said record medium after the magnetization thereof, said sheet being driven in an endless path;

pressing means operatively connected to said endless transfer magnetic sheet and said recording medium for pressing together the magnetized recording medium and said endless magnetic sheet;

means supplying an AC field coupled to said pressing means for transferring the first magnetic signals to the endless magnetic sheet while said endless magnetic sheet and said record medium are being pressed together;

a scanning means positioned downstream along the path of said endless sheet from said pressing means and having at least one recording head for recording a second magnetic signal onto said endless transfer magnetic sheet, said second magnetic signal being received by a receiving means from an outside source, and having at least one magnetic head for reading a magnetic latent image on said endless transfer magnetic sheet for transmitting said signal to an outside station via a transmitting means;



induction coil means coupled to said scanning means for transferring signals from said endless magnetic sheet to the transmission means via said magnetic head and for transferring signals to the receiving means to said endless magnetic sheet via said recording head;

developing means positioned adjacent said endless transfer magnetic sheet downstream from said scanning means for developing the magnetic latent image on said endless sheet by means of a magnetic powder, said powder being coated onto said endless sheet;

printing means positioned along the path of travel of said endless sheet and downstream from the development means for transferring a magnetic image from said endless sheet to a recording paper, said printing means comprised of a pressing means for pressing the magnetic image onto the recording paper by transferring the magnetic powder and a fixing means for fixing the magnetic powder onto the recording paper; and

demagnetizing means positioned along the path of said endless sheet downstream of said printing means for erasing the magnetic image on said transfer magnetic sheet.

3,852,526

INSPECTION INSTRUMENT

Edward E. McCullough, Brigham City; Kerry G. Zundel, Tremonton, and La Ron D. Binggeli, Logan, all of Utah, assignors to Thiokol Corporation, Bristol, Pa.

Filed Oct. 9, 1973, Ser. No. 404,522

Int. Cl. H04n *7/18*

U.S. Cl. 178—7.1 **10 Claims**

1. A bore inspection instrument comprising:

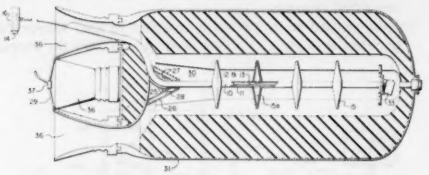
an inflatable base;

means for anchoring the base to some stationary part adjacent the bore to be inspected;

a cable held by the base, capable of sliding motion relative thereto, and including pneumatic tubes;

inflatable braces attached to the cable, each being attached to a tube therein;

means for controlling fluid flow, attached to the tubes of the cable and attachable to a source of gas, for controlling inflation of the base and of the inflatable braces; and



observation means attached to the end of the cable opposite the end attached to a control means.

3,852,527

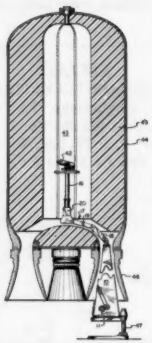
ARTICULATE INSPECTION INSTRUMENT

Richard M. McQuivey, Brigham City, Utah, assignor to Thiokol Corporation, Bristol, Pa.

Filed Oct. 9, 1973, Ser. No. 404,553

Int. Cl. H04n *7/18*

U.S. Cl. 178—7.1 **9 Claims**



1. An instrument for inspecting elongated cavities, comprising:

a pedestal;

an articulate arm having a plurality of segments hinged together in series, one end segment being hinged to the pedestal;

an orifice member hinged to the free end of the articulate arm;

a pair of long bands of spring material, biased to form tubes, threaded upwardly through the pedestal, the articulate arm, and extending through the orifice member;

means in the pedestal for anchoring and storing the lower end portion of the bands;

means in the pedestal and in the articulate arm for maintaining the bands flat until they are released to form concentric tubes;

means for extending and withdrawing the bands relative to the storage place therefor;

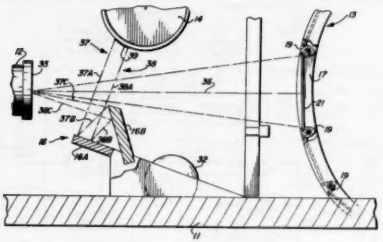
means for positioning the segments of the articulate arm as desired; and

observation means attached to the upper end of the concentric tubes formed by the bands.

3,852,528
MESSAGE DISPLAY DEVICE

Gilbert A. Robinson, 2441 E. Hemosa, Tempe, Ariz. 85282

Filed Oct. 23, 1973, Ser. No. 408,738
Int. Cl. H04n 5/24
U.S. Cl. 178—7.88 12 Claims

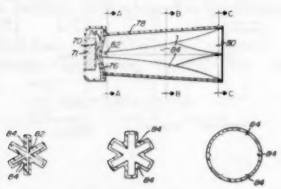


1. A message display device comprising in combination:
a frame,
a display assembly having a cylindrically shaped display surface rotatably mounted on said frame for presenting sequentially its display surfaces to a viewer mountable on said frame,
said surface defining a plurality of areas sequentially positioned around said display surface, each for receiving and holding a plurality of replaceable display items,
means mounted on said frame for rotating said display assembly about a fixed axis,
said means comprising a drive shaft for engaging a peripheral surface of said display assembly for rotation thereof about its longitudinal axis, and
illumination means for illuminating each item as it sequentially comes into view of the viewer upon rotation of said display assembly.

3,852,529
ACOUSTIC HORN

Hugo Willy Schafft, Des Plaines, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 10, 1973, Ser. No. 322,601
Int. Cl. H04r 1/20
U.S. Cl. 179—1 MG 16 Claims

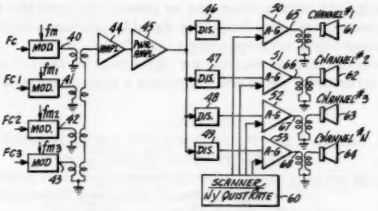


1. A horn for providing an impedance transformation between an acoustic translating means and an acoustic transmission medium comprising: an elongated tube member having a throat end connectible to said acoustic translating means and a mouth end for transferring acoustic energy between said horn and said acoustic transmission medium, said tube member having a plurality of elongated ribs positioned longitudinally within the interior of said tube member, each rib extending from an interior surface of said tube member into the space enclosed thereby to reduce the cross-sectional area, thereof, adjacent ones of said ribs being spaced substantially an equal distance from each other within said tube member and defining therebetween longitudinally extending passages having substantially equal lengths between said throat and mouth end to provide maximum high frequency response and to minimize phase cancellations within the operating range of said horn.

3,852,530
SINGLE STAGE POWER AMPLIFIERS FOR MULTIPLE SIGNAL CHANNELS

Michael T. Shen, 8 Place Dargent, Eich, Luxembourg

Filed Mar. 19, 1973, Ser. No. 342,836
Int. Cl. H04r 5/00
U.S. Cl. 179—1 GQ 9 Claims



1. Apparatus for amplifying a plurality of audio information signals by means of a common power amplifying stage, comprising:
a. a plurality of modulating means each operating at a separate carrier frequency and having a separate output, each separate one of said modulating means associated with one of said audio signals for providing a plurality of separate modulated signals each representative of one of said audio signals and differing one from the other by said carrier frequency,
b. power amplifying means having an input terminal and an output terminal, said input terminal including means for coupling each of said output terminals of said modulating means to said input terminal of said power amplifying means to provide at said output a composite signal representing the combination of all of said modulated signals,
c. a plurality of discriminator circuits, each associated with a separate one of said modulated signals each of said discriminator circuits having an input coupled to said output of said power amplifying means and an output for providing thereat said associated audio information signal,
d. a plurality of utilization means each separate one coupled to one of said discriminator output circuits,
e. scanning means operative to provide a plurality of waveforms at a plurality of separate outputs, each of said waveforms having the same repetition rate which rate is relatively higher than any frequency component contained in said audio information signals, and each having a predetermined signal duration and a specified delay between each waveform, and
f. means coupling a separate one of said outputs to one of said utilization means to cause said utilization means to utilize said discriminator output signal only during said predetermined signal duration.

3,852,531
ANSWER-ORIGINATE DATA COMMUNICATION SYSTEM

Richard D. Fretwell, and James W. Azbell, both of Columbus, Ohio, assignors to Design Elements, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 76,793, Sept. 30, 1970, abandoned. This application Feb. 5, 1971, Ser. No. 112,954
Int. Cl. H04m 11/06
U.S. Cl. 179—2 DP 12 Claims

1. A data system for communication over the standard type of telephone line in the answer or originate modes at inter-

changeable frequencies to a time shared computer, Teletype, or other data line comprising:

a telephone handset operable to receive an acoustical dual frequency signal,

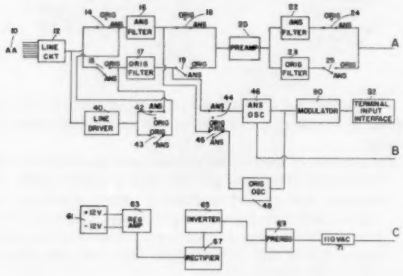
a carrier detector having a predetermined level output representative of a suitable carrier level,

means coupling said carrier detector to said telephone signal including an originate and an answer line filter,

a limiter also connected to said coupling means for converting said carrier signal to a constant-amplitude noise-free signal, said limiter including an integrated circuit operational amplifier with feedback circuit comprising a pair of transistors in a bridge configuration to limit signals to a predetermined level and to provide a signal of constant amplitude,

an originate discriminator and an answer discriminator for detecting said dual frequency signal to produce a bipolar output signal corresponding to the data received,

a slicer operable to increase the signal-to-noise ratio of said discriminated signal and to produce a squarewave output,



a Teletype driver for combining the data signal from said slicer and the carrier present signal from said carrier detector with that of preselected keyboard signals,

a transmit section including an originate oscillator and an answer oscillator for generating a dual frequency signal, means for providing said dual frequency signal to said transmit section for duplex operation,

a plurality of field effect transistor switching circuits, including a first and second field effect transistor switching circuit for said originate discriminator and said answer discriminator, and a third and fourth field effect transistor switching circuit for said originate oscillator and said answer oscillator; said switching circuits operable to activate interchangeably said discriminators and said oscillator and a fifth and sixth field effect transistor switching circuit for said originate line and answer line filters.

3,852,532

CONTROL SYSTEM FOR AN ELECTRICAL POWER LINE

Ronald L. Giles, Altavista, and Daniel L. Wetherell, Lynchburg, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed May 30, 1973, Ser. No. 366,075

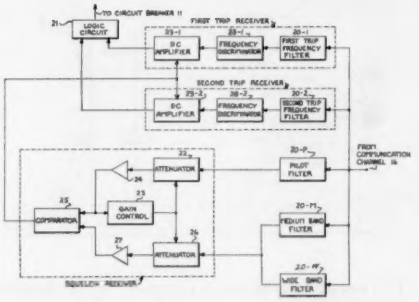
Int. Cl. H04q *9/00*

U.S. Cl. 179—2 R **6 Claims**

4. An improved control arrangement for power lines and the like comprising:

a. input means adapted to be connected to sensing equipment on the power line for receiving a trip signal in response to an undesired condtion on said power line;

b. transmitting means connected to said input means for producing a pilot frequency at a first level, a first guard frequency, and a second guard frequency in the absence of said trip signal; and for producing said pilot frequency at a level higher than said first level, a first trip frequency in place of and higher in frequency than said first guard frequency, and a second trip frequency in place of and lower in frequency than said second guard frequency in response to said trip signal;



c. and output means connected to said transmitting means and adapted to be connected to a communication channel for applying said frequencies to said communication channel.

3,852,533

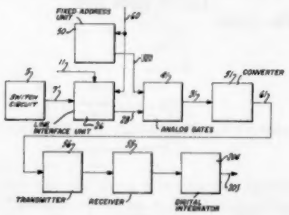
SAMPLING AND ANALOG-TO-DIGITAL CONVERTER APPARATUS FOR USE IN A TELEPHONE MESSAGE METERING SYSTEM

Gary C. Henrickson, Palo Alto, and John C. McDonald, Los Altos, both of Calif., assignors to Vidar Corporation, Mountain View, Calif.

Filed Jan. 5, 1973, Ser. No. 321,376

Int. Cl. H04m *15/38*

U.S. Cl. 179—8 A **18 Claims**



1. In a message metering system for metering the usage of a plurality of subscriber units in a telephone system, the apparatus comprising,

metering line means for carrying multi-level signals, one signal for each of a plurality of subscriber units in the telephone system,

attenuator means connected to receive said multi-level signals for forming multi-level attenuated signals where said attenuated signals include a plurality of levels representing usage conditions,

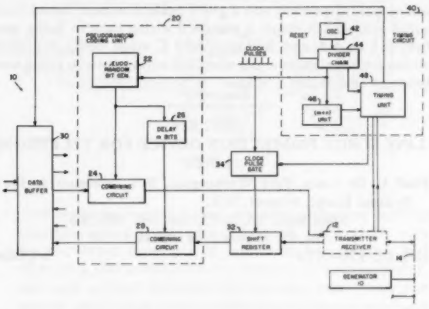
analog gate means for sampling said attenuated signals to form sampled signals,

analog-to-digital converter means for converting said sampled signals to digital representations.

3,852,534
METHOD AND APPARATUS FOR SYNCHRONIZING PSEUDORANDOM CODED DATA SEQUENCES

Tonis Tilk, Santa Monica, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 7, 1973, Ser. No. 367,697
Int. Cl. H04j *3/06*
U.S. Cl. 179—15 BS **2 Claims**



1. A method of maintaining synchronization between pseudorandom generators at separate locations when a communication channel is being used on a time shared, non-continuous basis, comprising the steps of:

generating, by individual stations, a periodic time period for transmission or reception of a communications signal during the time period;

transmitting message bits a fixed number of bit durations after the leading edge of the time period;

coding said message bits with the output from a pseudorandom bit generator;

time correlating said coding and said time period with a common time generating source;

receiving transmitted messages by a receiver station;

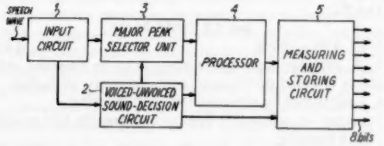
delaying the received message until the instant of the trailing edge of the time period; and

deciphering the delayed message by combining the message with coding bits from a pseudorandom bit generator.

3,852,535
PITCH DETECTION PROCESSOR

Jean-Frederic Zurcher, 34 Residence Corlay, Lannion, France (22300)

Filed Nov. 16, 1973, Ser. No. 416,623
Claims priority, application France, Nov. 16, 1972, 72.40703
Int. Cl. G10l *1/00*
U.S. Cl. 179—1 SA **3 Claims**

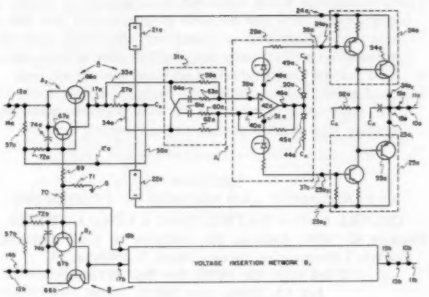


1. A processor for the detection of the pitch of a speech wave for use in connection with a vocoder system comprising means for detecting the major peaks of said speech wave means for converting said major peaks into a train of marker pulses, each pair of consecutive marker pulses of said train defining a pitch period, means for cancelling in said train each marker pulse separated from the preceding marker pulse by an interval shorter than the preceding pitch period by more than a tolerance amount, means for prohibiting the cancellation of more than a first given number of consecutive marker pulses, means for storing the value of each pitch period defined by two consecutive non-cancelled marker pulses and not differing from the preceding pitch period by more than a tolerance amount, means for substituting the preceding pitch period for each pitch period differing from said preceding pitch period by more than a tolerance amount and means for prohibiting the substitution for more than a second given number of consecutive pitch periods, of the respective preceding pitch periods.

3,852,536
TEST-THROUGH VOLTAGE BOOSTER CIRCUIT FOR TELEPHONE SYSTEMS

Charles W. Chambers, Jr., Amherst, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Filed May 16, 1973, Ser. No. 360,775
Int. Cl. H04g *1/28*
U.S. Cl. 179—16 F **14 Claims**



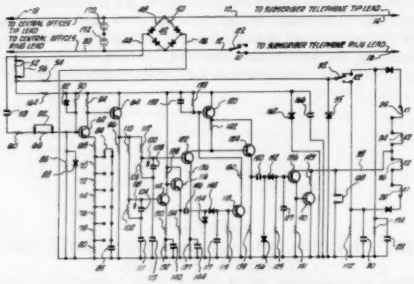
1. In a circuit adapted to introduce a d-c boost voltage in series with a subscriber line when operating current flows therethrough and to withhold such d-c boost voltage when test current flows therethrough, in combination, a central office terminal, a subscriber terminal, bi-directional switching means for conducting or blocking the flow of current between said terminals, through said bi-directional switching means, means for establishing a d-c boost voltage of a first polarity between said terminals when current flows through said bi-directional switching means in a first direction and has a magnitude which exceeds a first predetermined value, means for establishing a d-c boost voltage of a second polarity between said terminals when current flows through said bi-directional switching means in a second direction and has a magnitude which exceeds a second predetermined value, means for bypassing said switching means and for conducting current between said central office and subscriber terminals when said bi-directional switching means is non-conducting, and means for connecting said switching means in voltage responsive relationship to said central office terminal to conduct when the driving voltage at said central office terminal exceeds a predetermined value and to block when the driving voltage at said central office terminal is less than said predetermined value.

3,852,537

TELEPHONE STATION DISCONNECT DEVICE

Ogden W. Vincent, Anaheim, Calif., assignor to San/Bar Corporation, Santa Ana, Calif.

Filed Feb. 22, 1973, Ser. No. 334,633
Int. Cl. H04m *3/16*
U.S. Cl. 179—17 B **16 Claims**



1. A disconnect device intended for use with individual subscriber telephones in a multi-subscriber telephone system for enabling remote connection or disconnection of the individual subscriber telephones to a single pair of line conductors by which telephone service is extended from a central facility to all subscribers, said device comprising:

first means for being operated to complete or break an electrical connection between at least one of said pair of line conductors and a subscriber telephone, said first means being electrically installed between at least one of said pair of line conductors and said telephone; and

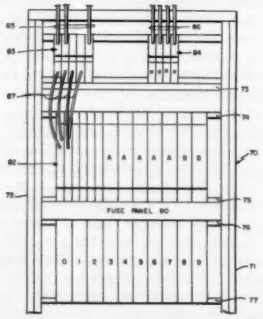
second means for operating said first means in response to the concurrent application of two predetermined frequency signals for a predetermined period.

3,852,538

ARRANGEMENT AND METHOD OF COMBINING TRUNKS AND A MATRIX INTO A SINGLE FRAME

Truman R. Mila, Batavia, Ill., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Sept. 14, 1973, Ser. No. 397,546
Int. Cl. H04q *1/04*; **H02b** *15/04*
U.S. Cl. 179—91 R **1 Claim**



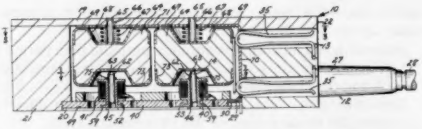
1. In a common control communication switching system including a plurality of trunks connectable through a matrix including A, B and C stages to any one of a plurality of service circuits, said trunks being machine wired to said A stage and said service circuits being connected to said C stage, a plurality of links connecting said A and B stages and a plurality of links connecting said B and C stages, said matrix being a concentration type matrix which is used only during the processing of a call and then released at the end of the call setup, the improvement comprising a frame, said trunks and said A and B stages being contained within said frame, said A stage performing a reduction of inlets to outlets and said B stage performing a further reduction of inlets to outlets, whereby the number of wires which have to be cabled to said C stage matrix frame is reduced, said trunks being assigned on an individual frame basis and a given pattern of said trunks being wired into said A stage, a standard wiring pattern being used between said A and B stages, said C stage being contained within another frame and a standard wiring pattern being used between said B and C stages.

3,852,539

LINE SURGE PROTECTION DEVICE FOR TELEPHONE LINES

Paul V. De Luca, Port Washington, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,386
Int. Cl. H04m *1/74*; **H03k** *17/00*
U.S. Cl. 179—174 **3 Claims**



1. In a line voltage surge protective device for telephone systems, of a type adapted to conduct a surge to ground potential, and remain in non-conductive condition with respect to ground during normal operation, the improvement comprises: a housing defining a cavity, means on said housing for electrical interconnection to a line to be protected, and to a source of ground potential, a gaseous discharge device interconnecting said line and said source of ground potential operative to conduct a voltage substantially above normal operating voltage, and heat sensitive means connected in series with said line to be protected and operative to short said gaseous discharge device to permit excess current to be conducted directly to ground.

3,852,540

EAR HEARING APPARATUS

Beda Diethelm, Zollikerberg, Switzerland, assignor to AG fur Elektroakustik

Filed Dec. 13, 1972, Ser. No. 314,902
Claims priority, application Switzerland, Dec. 30, 1971, 19184/71
Int. Cl. H04r *25/02*
U.S. Cl. 179—107 E **4 Claims**

1. A hearing apparatus arranged to be inserted into the auditory channel of the user, said apparatus including:

a. a substantially elongate two-part housing;

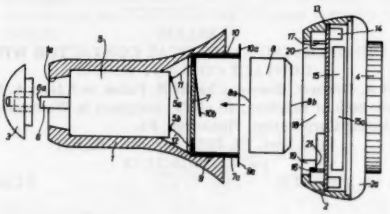
b. means for releasably interconnecting the two portions of said housing;

c. an output transducer arranged in a first portion of said housing;

d. an input transducer capable of magnetic and electrical reception, an amplifier and a gain control arranged in the second portion of said housing;

e. a voltage source;

f. means for receiving and retaining said voltage source in said first housing portion between said output transducer and said amplifier when said portions of said housing are releasably connected at the region of interconnection;
g. said output transducer having a pair of input terminals;
h. said amplifier having contacts; and



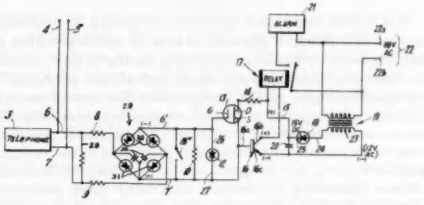
i. said retaining means being provided with two contact elements which are fixedly connected, respectively with the two input terminals of said output transducer and releasably connected with the contacts of said amplifier, one such contact element coming into contact with one pole of said voltage source whereas the other pole of said voltage source is coupled with the amplifier.

3,852,541

BURGLAR ALARM ACTUATED BY CUT TELEPHONE WIRE

Edmund C. Altenberger, Box 595, Bernardsville, N.J.

Filed Aug. 10, 1973, Ser. No. 387,462
Int. Cl. H04m *3/22*
U.S. Cl. 179—175.25 **15 Claims**



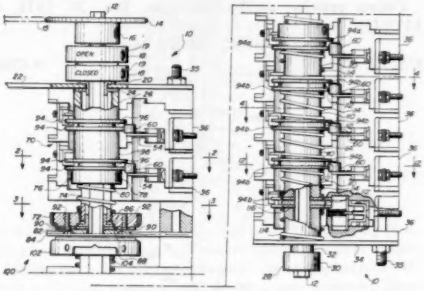
1. A telephone set cut-line alarm device, comprising in combination: separate positive and negative connector leads; at least each of a first resistor means and a zener diode connected across said leads; at a corresponding end of each of said connector leads, second and third resistor means connected one per lead in series, and at an opposite end of each respective resistor means each resistor means being connectable to a telephone-set line of optional polarity; said zener diode being connected for unidirectional electron flow from said negative lead to said positive lead; a field effect transistor having separate gate, drain and source leads, said gate lead being connected to said zener diode at a negative lead thereof; first switch means having second circuit input and output switch contacts for turning on and off respectively a first current flow controllable of a first relay-activation circuit-second current flow, said first switch means being operatively connected to one of said source leads and to said drain lead of said field effect transistor; a first capacitor means having first and second leads at least one of which is operatively connected to said zener diode at a positive terminal thereof such that discharge of potential at said gate takes place whenever telephone line voltage on either of said connector leads is terminated or significantly decreased, such that the gate potential is prior to discharge, of a predetermined magnitude large enough to prevent current flow through said drain to said source; a second current-flow circuit including in series within said second current-flow circuit a direct current means providable of direct current, first relay means having first-circuit input and output actuation leads connected for activating said first relay means, and said switch of said first switch means, and operatively connected to said source lead; fourth resistor means connected between said drain lead and one of said first relay means input and output leads; and said first relay means including alarm-circuit switch contacts, said first relay input lead being connected in series with one of said first switch means second circuit contacts; and said capacitor means being for attenuating AC current.

3,852,542

ADJUSTABLE CAM MULTIPLE CONTACT SWITCH ARRANGEMENT

Edward J. Rogers, Chicago, and David Evans, Palatine, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Sept. 14, 1973, Ser. No. 397,415
Int. Cl. H01h *19/62*
U.S. Cl. 200—31 R **1 Claim**



1. A multiple contact switch arrangement comprising:
a first end plate;
a second end plate;
a shaft removably mounted for rotation between said first and second end plates;
means for rotating said shaft;
a plurality of switch support blocks removably mounted against one another between said end plates in a stacked relationship adjacent to said shaft, said switch support blocks having coincident openings therethrough parallel to said shaft;
removable mounting means positioned through the openings in said switch block for disengageably mounting said switch support blocks between said first and second end plates;
a first set of cams removably mounted on said shaft for rotation with said shaft, said first set of cams having protrusions positioned on the periphery thereof;
a second set of cams removably mounted on said shaft for rotation with said shaft, said second set of cams having protrusions positioned on the periphery thereof;
a pair of stationary contacts mounted on each of said support blocks;
a plurality of movable contact bridging members each slidably mounted on a respective support block for electrically connecting a respective pair of stationary contacts; spring means for biasing said movable contact bridging members toward said stationary contacts;

a plurality of cam followers, each pivotably mounted on a respective support block, each of said cam followers having a first end engaging and following a respective cam and a second end connected to a respective movable contact bridging member so that when said first end engages the protrusion on its respective cam, said cam follower moves its respective contact bridging member to electrically disengage the respective stationary contacts;

first adjusting means for permitting adjustment of the angular position of said first set of cams with respect to the angular position of said shaft as a unit so that the angular position of said shaft at which each of said respective contact bridging member disengages its respective stationary contacts can be predetermined; and

second adjusting means for permitting adjustment of the angular position of each cam of said second set of cams independently with respect to the angular position of said shaft so that the angular position of said shaft at which each of said respective contact bridging members disengages its respective stationary contacts can be independently predetermined.

3,852,543
DIRECTION INDICATOR AUTOMATIC RETURN DEVICE

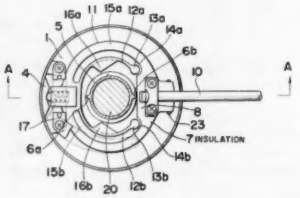
Masaru Suzuki, Takemura Atusi, Chiryu, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Aichi-ken, Japan, by said Suzuki

Filed Dec. 20, 1972, Ser. No. 316,821

Claims priority, application Japan, Dec. 28, 1971, 47-1174[U]

Int. Cl. H01h *3/16*

U.S. Cl. 200—61.27 **6 Claims**



1. A direction indicator automatic return device for use in a motor vehicle comprising:

a restoring cam, secured to a steering column in the motor vehicle, having a pair of cam lobes arranged on opposite sides of the steering column;

a main body arranged concentrically around the steering column; and

a movable bracket supported by said main body in concentric relation with the steering column for rotation about said steering column,

said movable bracket including a curved peripheral outer portion, a pair of curved, cantilever-like ratchet arms spaced from an inner surface of said outer portion, and flexible holding means for holding said movable bracket into one of a left-turn, right-turn and neutral position, each of said pair having one end secured to said movable bracket to form a first gap between said ratchet arms and said inner surface over substantially the length of said ratchet arms and having a free end separated from said inner surface by a second smaller gap,

each said ratchet arms having a triangular engagement portion disposed approximately in a central portion of each said ratchet arms and said triangular engagement portion having a vertex facing said steering column,

wherein, upon rotation of said movable bracket to one of a position indicating a left turn and a right turn, one of said triangular engagement portions comes into the circle of rotation of said cam lobes so that one of said cam lobes engages an oblique side face of said one triangular engagement portion during turning of said steering column such that said free end closes said second smaller gap and contacts said inner surface, thereby forming a centrally flexible beam that enables flexion of said ratchet arm to allow said cam lobe to pass over said triangular engagement portion.

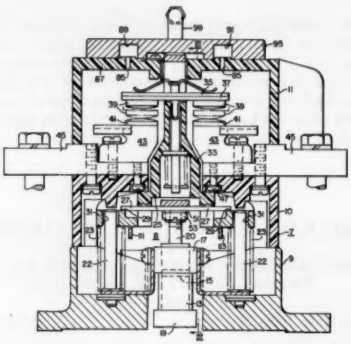
3,852,544
FLUID OPERATED ELECTRICAL CONTACTOR WITH CONTACT COOLANT MEANS

Kurt A. Grunert, Beaver; Charles R. Paton, and John A. Sentak, both of Brighton, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 17, 1973, Ser. No. 398,021

Int. Cl. H01h *35/38*

U.S. Cl. 200—82 R **5 Claims**



1. A circuit interrupter structure comprising an electrically insulating housing, a plurality of sets of contacts within the housing and comprising stationary contacts and movable contacts movable between open and closed positions, an elongated contact carrier along which the sets of movable contacts are disposed in spaced relationship, reversible fluid drive means comprising at least two fluid cylinder and piston structures and having piston shafts connected to and at spaced positions along the elongated contact carrier, the fluid drive means comprising a remotely controlled valve mechanism directing fluid into one or the other side of the fluid cylinders uniformly so that the assembly of the elongated contact carrier and the sets of movable contacts is movable in a stable, non-binding manner.

3,852,545
SWITCHING MECHANISM ASSOCIATED WITH GOVERNOR MECHANISM

Naoji Sakakibara, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Asahi-machi, Kariya-shi, Aichi-ken, Japan

Filed Nov. 14, 1973, Ser. No. 415,785

Claims priority, application Japan, Nov. 29, 1972, 47-137203

Int. Cl. H01h *35/10*

U.S. Cl. 200—80 R **9 Claims**

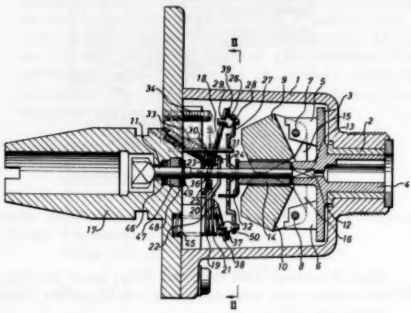
1. In a governor switch apparatus comprising a housing mounted on a switch base, a governor mechanism assembled within said housing to be driven at various speeds of a rotary element, and a switching mechanism assembled on said switch base to be actuated by said governor mechanism,

the improvement wherein said switching mechanism comprises

a seesaw lever to be actuated at its central portion by said governor mechanism in response to the speed of said rotary element;

a first switching means with self-biased over-center snap action connected with a first end of said lever and including a first normally open switch;

a second switching means with self-biased over-center snap action connected with a second end of said lever to be arranged symmetrically with said first switching means around said lever and including a second normally open switch;



means for blocking the movement of the first end of said seesaw lever after closure of said first switch by means of actuation of said lever; and

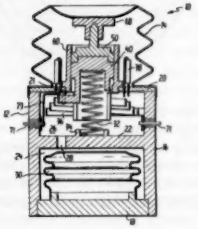
a resilient means interposed between said second switching means and said switch base for normally biasing the second end of said seesaw lever against actuating force exerted on said lever to close said second switch after the closure of said first switch.

3,852,546

PRESSURE ACTUABLE SWITCH APPARATUS WITH BELLOWS AND FLUID DAMPING MEANS

Richard F. Maxwell, Jr., Baltimore, Md.; Forrest E. Coyle, Pittsburgh, and George W. Gillepsie, West Mifflin, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 6, 1973, Ser. No. 338,488
Int. Cl. H01h *35/34*
U.S. Cl. 200—83 C **2 Claims**



1. Pressure actuatable switch apparatus comprising:

a. an envelope for receiving switch means therein and having a diaphragm portion displaceable in response to changes of external pressure with respect to that established within said envelope;

b. first and second contacts disposed within said envelope, at first and second switch positions, respectively;

c. said switch means comprising a switch member movable to each of said first and second switch positions;

d. translating means for securely setting said switch member at each of said first and second positions and responsive to the displacement of said diaphragm portion to release said switch member from said first position and move said switch member to said second position, said translating means effecting the movement of said switch member from said first position to said second position in response to the increase of the external pressure from a normal pressure level to a first pressure level and the subsequent decrease of the external pressure from said first level to said normal pressure level; and

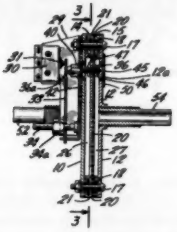
e. reset means responsive to the increase of external pressure from said normal level to a second level greater than said first level for disposing said switch member to said first position.

3,852,547

DIFFERENTIAL PRESSURE SWITCH WITH HINGED PLATE ON DIAPHRAGM

Henry G. Dietz, 80 Salisburg Ave., Garden City, N.Y. 11530

Filed Aug. 24, 1973, Ser. No. 391,052
Int. Cl. H01h *35/34*
U.S. Cl. 200—83 Y **7 Claims**



1. A differential pressure switch comprising a housing comprising two spaced, opposed plates defining a fluidtight space therebetween, a flexible pressure responsive diaphragm comprising a flexible material and a diaphragm pressure plate bonded to said flexible material separating said space into two compartments, a rigid member having an edge surface in said space opposed to an edge surface of said pressure plate and in close proximity therewith, the edge surfaces jointly defining a hinge for said pressure plate about which the pressure plate pivots, an electrical contact mounted on said housing exteriorly of said space, an actuator for actuating said contact to an operative position comprising a flexible flat spring mounted exteriorly of said casing for flexing to a position to close said contact, an axially displaceable pin in communication with the interior of said housing and extending outwardly thereof for bearing against said float spring to deflect it in a direction for closing said contact, an actuating element mounted on said diaphragm for movement therewith to contact and engage said pin to actuate it in response to a pressure differential in said compartments flexing the diaphragm in a direction for actuating said switch, and connectors for applying a medium to one of said compartments to develop said differential pressure.

3,852,548

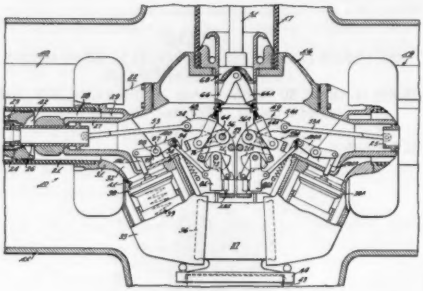
ACTUATING MECHANISM FOR CONTACT AND BLAST VALVE UNIT

Edwin C. Goodwin, Jr., Canton, Mass., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed July 18, 1973, Ser. No. 380,250
Int. Cl. H01h *33/42*
U.S. Cl. 200—148 F **12 Claims**

1. A circuit breaker of the fluid-blast type including a stationary contact;

a movable contact separable from said stationary contact to establish an arc;
a source of fluid under pressure;
a blast valve operably connected between said source of fluid under pressure and the area where an arc is drawn between said contacts, said blast valve being normally biased to a closed position, and operable when mechanically actuated to an open position to direct a blast of fluid under pressure to the area of arcing;
a frame;
a rocker arm pivotally supported by said frame;
a blast valve engaging rod carried by said rocker arm in position to engage and displace said blast valve to an open position when said rocker arm is pivoted in one direction;



operating linkage means operably connected to move said movable contact to open position;
a pivotal latch member operably connected to said rocker arm, said latch member being releasably connected to said operating linkage in a manner that the operation of said linkage means in a first direction to actuate said movable contact to open position effects the pivotal movement of said latch to actuate said rocker arm to move said blast engaging rod into displacing engagement with said blast valve to open said blast valve; and,
a fixed abutment against which said latch member engages after said latch member has been moved to effect the opening of said blast to effect a release of said latch member from said operating linkage to thereby permit said blast valve to return to its normal biased closed position.

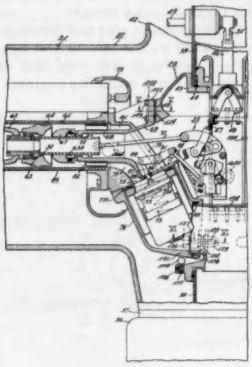
3,852,549

PLUG-IN CONTACT AND BLAST VALVE UNIT

Edwin C. Goodwin, Jr., Canton, Mass., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed July 18, 1973, Ser. No. 380,248
Int. Cl. H01h *33/54*
U.S. Cl. 200—148 R **20 Claims**

1. In a gas-insulated circuit breaker:
a circuit breaker tank having a service opening;
a contact and blast valve unit insertable through the service opening in said tank into operative position in said tank;
a gas supply distribution member supported within the interior of said tank;
an outlet formed on said distribution member;
a tapered inlet formed in said contact and blast valve unit to cooperate with said outlet of said distribution member; and,
an O-ring carried by said outlet for effecting a gas-tight seal between said outlet and inlet when mating engagement is



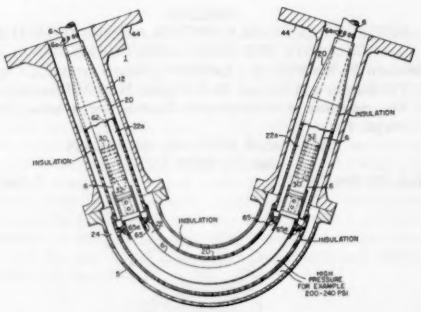
effected between said inlet and outlet upon insertion of said contact and blast valve unit into operating position within said tank.

3,852,550

NON-RESTRICTING CONDUCTOR FILTERING SYSTEM FOR A HIGH-VOLTAGE CIRCUIT BREAKER

August U. Bertolino, Jeannette; Joseph A. Penkova, and William G. Carrell, both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 13, 1972, Ser. No. 288,843
Int. Cl. H01h *33/54*
U.S. Cl. 200—148 B **17 Claims**



1. A high-voltage high-power compressed-gas circuit interrupter, comprising, in combination:
a. means defining a high-pressure interrupting region **(15)**;
b. a pair of cooperable separable contacts **(14, 16)** at least one of which **(14)** is tubular and both contacts disposed within said high-pressure interrupting region **(15)**;
c. relatively low-pressure exhausting means **(26)** pneumatically connected with said one tubular contact **(14)** to receive an exhausting blast of high-pressure gas from said high-pressure interrupting region **(15)** during the arc-interruption process;
d. a hollow metallic high-voltage line-conductor **(6)** constituting a first high-pressure storage region electrically connected to one of said separable contacts and freely vented to said high-pressure interrupting region **(15)**;

e. a hollow insulating barrier member (**20**) surrounding said high-voltage metallic line-conductor (**6**) and defining an annular sealed second high-pressure region (**22**);

f. means defining a third outer high-pressure region (**24**) freely communicating pneumatically with said high-pressure interrupting region (**15**) and disposed about said barrier member (**20**); and,

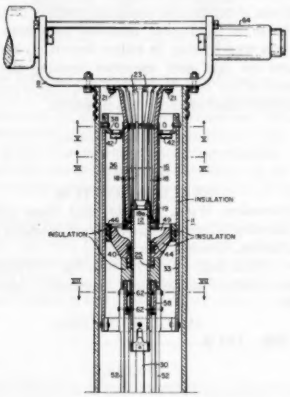
g. means defining equalization opening means (**32**) provided in the wall of said inner hollow metallic high-voltage line-conductor (**6**) which pneumatically intercommunicates the interior (**62**) of the high-voltage metallic line-conductor (**6**) with the annular region (**22**) within the barrier member (**22**), whereby a sudden drop of pressure within the outer high-pressure region (**24**) will not fracture the barrier member (**20**) because of the permissible rapid equalization of pressure across the barrier member (**20**) provided by said equalization opening means (**32**).

3,852,551

PUFFER-TYPE COMPRESSED-GAS CIRCUIT-INTERRUPTER

Charles M. Cleaveland, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1972, Ser. No. 292,209
Int. Cl. H01h *33/88*
U.S. Cl. 200—148 A **7 Claims**



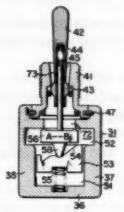
1. A gas-blast puffer-type circuit-interrupter including a longitudinally-extending insulating casing having a first end and an oppositely-disposed second end, means at least partially of metal closing said first end of the casing and stationarily supporting therewithin a generally tubularly shaped stationary contact structure, a combined stationary fixed piston and hollow orifice structure fixedly supported from the other second end of the insulating casing, support-rod means extending longitudinally interiorly of said insulating casing to fixedly support said combined fixed piston and hollow orifice structure from the second end of the insulating casing, a movable tubular venting contact linearly movable and operable from the second end of the casing through said combined fixed piston and orifice structure and into and out of contacting engagement with said generally tubularly shaped stationary contact structure, a movable operating cylinder (**33**) operatively mechanically linked to the movable contact adjacent the second end of the casing and having an annularly-shaped closed-end portion (**38**) encircling said generally tubularly shaped stationary contact structure, said movable operating cylinder (**33**) during the opening operation compressing gas and forcing the compressed gas to flow into the tubularly shaped stationary contact structure and also in the opposite direction through said combined fixed piston and hollow orifice structure and then into the interior of the moving tubular venting contact for arc-extinction purposes, the outer peripheral portion of the fixed piston and hollow orifice structure being wholly composed of insulating material so that in the fully-open-circuit position insulating gas is interposed between said peripheral portion of the fixed piston structure and said stationary tubular contact to thereby elminate creepage and arc tracking over insulating surfaces and thereby avoid electrical breakdown.

3,852,552

TOGGLE SWITCH

Hiroatsu Kimijima; Shohei Iizuka, both of Yokohama, and Hironao Fujii, Kawasaki, all of Japan, assignors to Fujisoku Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 20, 1973, Ser. No. 399,093
Claims priority, application Japan, Sept. 20, 1972, 47-109082; Dec. 1, 1972, 47-138356
Int. Cl. H01h *3/46, 5/10*
U.S. Cl. 200—153 G **5 Claims**

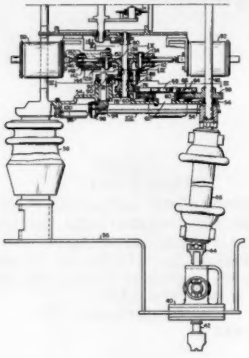


1. A toggle switch comprising a cylindrical sleeve; a case having the edge of an opening at one end fitted with the cylindrical sleeve and bored with horizontal and vertical grooves; a toggle lever penetrating the cylindrical sleeve with the operative end of said lever exposed to the outside and rotatably supported on the inner walls of the cylindrical sleeve; a slidable member fitted to the end of the toggle lever received in the case so as to slide through the horizontal groove of the case and having one part of the underside provided with a conical projection and another part of said underside bored with an engagement groove; a cam having its surface sufficiently undulated to assure the operative and inoperative conditions of the toggle switch and, when the toggle lever is operated, designed to move upward or downward through the vertical groove of the case according to the movement of the projection of the slidable member in contact with the undulated surface; a spring positioned between the underside of the cam and the inner wall of the case bottom so as to urge the cam upward against the depressive force of the projection; a support plate fitted to the inside of one side wall of the case to protect the projection, cam and spring; a movable contact member having its base rotatably supported on the support plate and its upper end fitted into the engagement groove; a pair of stationary contact members fixed to the support plate in a manner to face each other across the movable contact member; and contact terminals projecting from the base of the movable contact member and stationary contact members to the outside of the case.

3,852,553
VACUUM SWITCH WITH TOGGLE ASSEMBLY OPERATING MECHANISM

Robert C. Lingenfelter, and Andrew Sabella, both of Sharon, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 2, 1973, Ser. No. 385,197
Int. Cl. H01h *3/46*
U.S. Cl. 200—153 G **9 Claims**



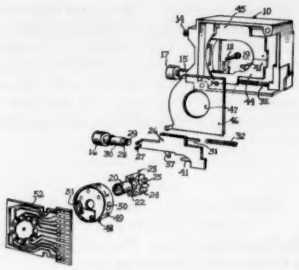
1. Tap changing apparatus comprising:
a selector switch which is moveable to contact different tap terminals;
first, second, and third vacuum switches switchable in a predetermined sequence to transfer a load connected to the tap changing apparatus from one tap terminal to another tap terminal, each of said vacuum switches having a stationary and a moveable contact;
a moveable cam;
connecting means for connecting the moveable contact of each vacuum switch to said cam;
drive means coupled to said cam to receive the force which moves said cam;
forcing means for applying the moving force to said drive means;
toggle means for quickly moving said forcing means when said toggle means has been shifted to a predetermined position;
input means for shifting said toggle means to the predetermined position; and
an input shaft which drives said input means, with said input means comprising a plurality of mechanical members coupled to said input shaft and said toggle means, and with the rotation of said input shaft in one direction providing movement of said forcing means and said toggle means together until said toggle means has been shifted to the predetermined position, and then allowing the forcing means to be quickly moved by said toggle means without a change in the speed of rotation of said input shaft.

3,852,554
BIDIRECTIONAL ROTARY PUSH-BUTTON SWITCH

Stanford M. Heide, Kenosha, Wis., assignor to Chicago Dynamics Industries, Inc., Chicago, Ill.

Filed Nov. 21, 1973, Ser. No. 417,714
Int. Cl. H01h *13/58*
U.S. Cl. 200—156 **6 Claims**

1. In a bidirectional rotary push-button switch having switch contacts rotatable in either direction through a plurality of switch positions and housed within an open-sided hollow case, and a removable side cover therefor, the combination comprising
a. a rotatable gear member having teeth of a predetermined width for rotating said switch contacts in either direction within the case,
b. a pair of operating members diametrically disposed on opposite sides of the axis of said gear member and laterally offset with respect to each other and mounted for independent reciprocal linear movement tangentially with respect to said gear member,

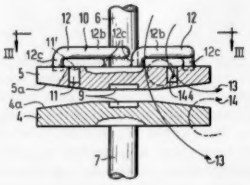


c. gear-rotating means carried by each of said operating members independently and alternately engageable with the teeth of said gear member to rotate said switch contacts step-by-step in either direction, and
d. means on said gear member limiting the continuous rotation of the switch contacts in either direction beyond a selected number of switch positions.

3,852,555
VACUUM SWITCH

Dieter Schuocker, Wien, Austria, and Hans Joachim Lippmann, Boxdorf, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed July 17, 1973, Ser. No. 379,995
Claims priority, application Germany, July 19, 1972, 2235359
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **20 Claims**

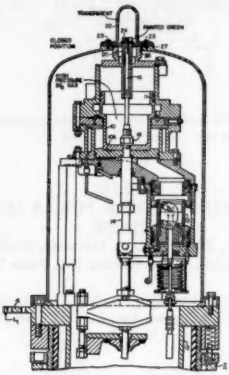


1. A vacuum switch having an evacuated housing containing a pair of relatively separable disk-shaped switching contacts, one of which contacts has a central portion attached to a central electrically conductive supporting member which is coaxially surrounded by a coil structure electrically parallel to the supporting member, the improvement comprising:
said coil being connected to an area of said one contact which is spaced from said supporting part;
said area being at least partially separated by a gap from said central portion;
and a permeable material in said gap.

3,852,556
COMBINATION HAND-JACK, SEMAPHORE AND TRAVEL INDICATOR FOR HIGH-VOLTAGE CIRCUIT INTERRUPTER

Richard E. Kane, Monroeville, and William H. Fischer, Penn Hills, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1969, Ser. No. 889,635
Int. Cl. H01h *9/16*
U.S. Cl. 200—310 **4 Claims**



1. A circuit breaker comprising, in combination:

a. a movable contact cooperable with a stationary contact to establish an arc and open the connected circuit;

b. an indicator-rod responsive to movement of the movable contact in its opening and closing movements;

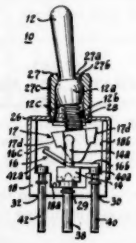
c. a semaphore secured to the indicator-rod to indicate visibly the open and closed-circuit positions of the circuit breaker;

d. said indicator-rod including thread means whereby a manually operable hand-jack threadedly related to said indicator-rod may be substituted for the semaphore indicator, said manually operable hand-jack causing the relatively slow opening and closing movement of said circuit breaker.

3,852,557
ELECTRIC SWITCH WITH PIVOTING AND WIPING MOVABLE CONTRACTOR

Harry W. Brown, Big Bend, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed July 12, 1973, Ser. No. 378,410
Int. Cl. H01h *1/22*
U.S. Cl. 200—241 **4 Claims**

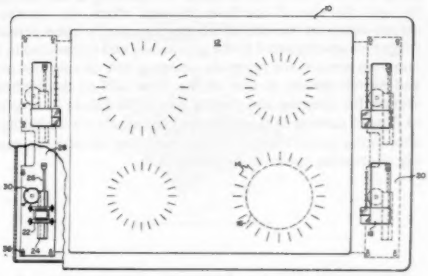


1. In an electric switch, in combination:
an insulating housing,
a plurality of stationary contacts mounted in spaced relation in said housing,
a rigid movable contactor support member in circuit with and mounted in limited lateral rocking relation on one of said stationary contacts,
a movable contactor pivotably mounted on said support member to selectively engage with the other of said stationary contacts, and
operating means comprising an actuating member for sliding on and pivoting said contactor into engagement with said other of said stationary contacts and having lost motion driving connections with said support member to engage with and rock said support member to slide said contactor on each of said other of said stationary contacts following engagement therewith.

3,852,558
MAGNETICALLY COUPLED CONTROL FOR COOKING PLATFORM

Earl W. McCleerey, Monroeville, and William A. English, Export, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1974, Ser. No. 455,158
Int. Cl. H05b *5/08*
U.S. Cl. 219—10.49 **5 Claims**

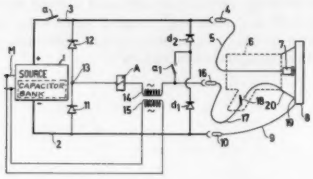


1. In a magnetically coupled type of control arrangement for a cooking platform having a heat producing element:
a user-operated control member on the accessible side of a control panel;
a follower member on the other side of said panel adapted to be magnetically coupled to said control member;
a support plate spaced from said other side of said panel;
a controller for controlling energization of said heat producing element mounted to said support plate and including a rotatable shaft projecting therefrom and having a pinion gear fixed thereon;
a guide bar mounted at its ends on said plate and having a straight length extending on both directions beyond said gear; and
a support member for said follower member having a gear rack on one side for engagement with said pinion gear, and provided with a pair of opposite, open-ended slots on the opposite side to accommodate the ends of said guide bar in the rectilinear movement of said support member, said guide bar ends serving as opposite end limits to movement of said support member.

3,852,559
STUD WELDING APPARATUS

Dankmar Tauern, Triesenberg, Germany, assignor to Hilti Aktiengesellschaft, Fuerstentum, Liechtenstein

Filed July 12, 1973, Ser. No. 378,385
Claims priority, application Germany, July 12, 1972, 2234304
Int. Cl. B23k *9/20*
U.S. Cl. 219—98 **16 Claims**



1. A stud welding apparatus for direct current welding of an elemental part to a base part, comprising a direct current source of welding energy, a pair of conductive lines of different polarity coupled to the source for carrying current from said source, welding gun means for positioning the elemental part relative to the base part so that welding can take place, connector means for reversably connecting one of said lines having one polarity to one of the parts and a second of said lines having the other polarity to the other of the parts, circuit means having a common section connected by the gun means to one of the parts and first and second portions respectively coupling said common section to each of said lines and decoupling the lines from each other for forming a current path through the one of the lines through which the connector means connects the one of the parts normally open actuable trigger means mounted in the gun means and connected in the common section for normally opening and closing the path, and switch means in one of the lines and in the common section for opening and closing one of said lines in response to flow of current in the path, said circuit means including an alternating current source in said common section for applying alternating cycles through the path.

3,852,560
CONTINUOUS ELECTRONIC HEATING DEVICE FOR METALLIC WIRE AND SHEET METAL

Dominique Streel, Sclessin-Ougree, Belgium, assignor to Cockerill-Ougree-Providence et Esperance-Longdoz, Seraing-lez-Leige, Belgium

Filed May 21, 1973, Ser. No. 362,608
Claims priority, application Belgium, May 31, 1972, 43722
Int. Cl. B23k *15/00*
U.S. Cl. 219—121 EB **6 Claims**

1. An electron heating device for a metallic wire or sheet comprising, in combination:

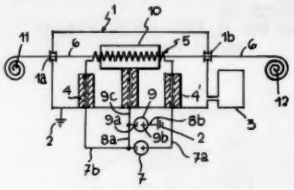
a processing enclosure in which is maintained a vacuum of 10^{-3} to 10^{-5} torr and which is traversed by a continuously advancing metallic wire or sheet to be heated;

an electron emitter mounted in the enclosure, said emitter comprising an electrical conductor in the form of a coil having at least one turn and along the axis of which the metallic wire or sheet is continuously advancing;

a first source of current connected to said coil;

a second source of current whose negative teriminal is connected to said coil and which has a very strong negative potential, thereby establishing an electrostatic field for accelerating the emitted electrons toward the metallic wire or sheet; and

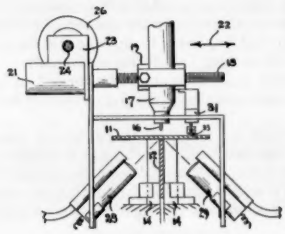
a metallic electron reflecting means connected to the negative terminal of said second source of current for reflecting back to the metallic wire or sheet any electrons which have escaped the electrostatic field.



3,852,561
CONSTANT SPEED CONTROL FOR AN AUTOMATIC WELDER

Dale R. Brubaker, 2906 Onrado, Torrance, Calif. 90503, and Daniel S. Weinstein, 3320 Starline Dr., Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 244,376, April 17, 1972, abandoned. This application Apr. 30, 1973, Ser. No. 355,626
Int. Cl. B23k *9/12*
U.S. Cl. 219—125 R **12 Claims**



1. A constant speed control for a tool to be moved along a predetermined curved path in a plane of a workpiece, said control comprising:

first means for moving said tool along a longitudinal axis parallel to the longitudinal axis of said workpiece;

second means for simultaneously moving said tool along a transverse axis with respect to said longitudinal axis of said workpiece; and

speed control means for maintaining a constant speed of said tool along said curved path, said speed control means coupled for travel with said tool.

3,852,562
WELDING CRATER FILL MECHANISM

Richard L. Linam, League City, Tex., assignor to Kelso Marine, Inc., Galveston, Tex.

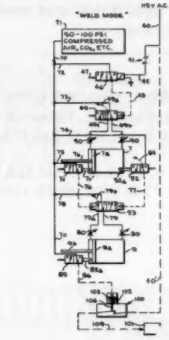
Filed May 22, 1973, Ser. No. 362,779
Int. Cl. B23k *9/12*
U.S. Cl. 219—125 R **15 Claims**

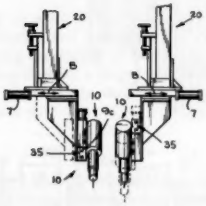
1. A welding crater fill mechanism for use with a welding gun on weldment components moving relative to the welding gun comprising:

a. support means for supporting the welding gun;

b. means on said support means to accommodate movement of the welding gun into position for welding the weldment components;

c. means to determine the length of the weld between the weldment components; and





d. means to effect movement of the welding gun at the termination of the weld length so that the welding gun overlaps at least a portion of the weld.

3,852,563

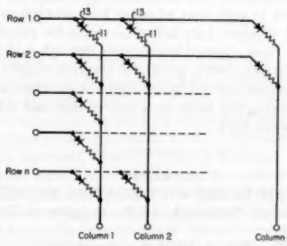
THERMAL PRINTING HEAD

Jaime H. Bohorquez, Escondido, and Norman H. MacNeil, Poway, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 1, 1974, Ser. No. 438,883

Int. Cl. H05b *1/00*

U.S. Cl. 219—216 **5 Claims**



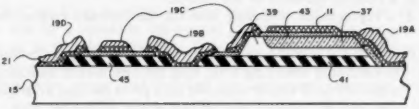
1. A thermal printing device comprising:

a sapphire substrate;

a body of semiconductor material epitaxially grown on the substrate;

a plurality of thin film heating elements on the body of semiconductor material;

a plurality of semiconductor devices diffused into the body of the semiconductor material;



a plurality of metallic interconnections among the heating elements and the semiconductor devices; and

a plurality of highly conductive regions diffused in a single layer of the body of semiconductor material, said regions being interconnected among the heating elements and the semiconductor devices to serve as electrical connections therebetween.

3,852,564

ELECTRICALLY HEATED WINDOWS

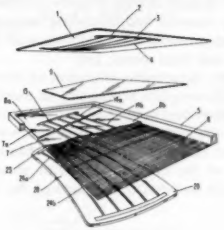
Hans Baum, Porz-Urbach; Ralf Reinicke, Porz-Zundorf, and Dieter John, Porz-Eil, all of Germany, assignors to Saint-Gobain Industries, Neuilly sur/Seine, France

Division of Ser. No. 17,182, March 6, 1970, abandoned. This application Apr. 9, 1973, Ser. No. 349,431

Claims priority, application Germany, Mar. 7, 1969, 1911555; Mar. 8, 1969, 1911561

Int. Cl. H05b *3/06*

U.S. Cl. 219—522 **4 Claims**



1. A thermal window comprising a smooth-surfaced transparent glass sheet, a plurality of opaque electrically conductive resistance lines of hardened metallic ink adhered to a surface of said sheet, at least some of said lines being of uniform composition along the length thereof and having a cross-section which is smaller over a common viewing portion of the length thereof between their ends than over the end portions thereof for increased heating within said viewing portion, said at least some lines extending substantially parallel to each other and having a width and being separated one from the other by a distance so as not to obstruct visibility through said glass sheet, and electrically conductive resistance lines adhered to said surface and connecting ends of said plurality of lines into a single circuit.

3,852,565

SOLDER FEEDING SOLDERING GUN WITH TEMPERATURE CONTROL

Alfred Kager, 71, Inkeidener Strasse, Frankfurt am Main, Germany

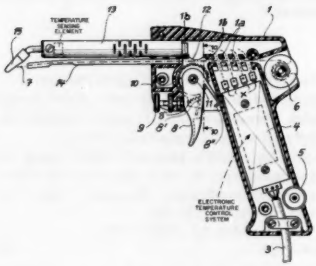
Filed Sept. 12, 1972, Ser. No. 288,466

Int. Cl. H05b *1/02;* **B23k** *3/06*

U.S. Cl. 219—241 **5 Claims**

1. A one-hand soldering gun having temperature control means comprising

a. a two-part hollow plastic casing including a butt portion;
b. a barrel and a feed tube projecting forwardly from said casing;
c. a heating element in the barrel;
d. a replaceable soldering iron on the forward end of the barrel;
e. means for feeding a soldering wire from a supply bobbin toward said soldering iron, said feeding means including a ratchet feed wheel rotatable on a pivot pin and arranged directly to contact and advance the soldering wire, a trigger having a longitudinally extending slot therein mounted on said pin, said ratchet wheel being located in said slot in said trigger, and a spring biased pawl mounted in said slot in said trigger for engaging said ratchet wheel;
f. elements defining a slideway for the soldering wire;



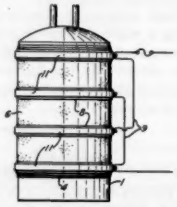
g. a pair of spaced slotted holders, a press-down spring detachably secured and extending between said slotted holders and pressing said soldering wire against the periphery of said feed wheel, and
h. pins for the detachable affixation of terminals on a divided conductor plate supporting an electronic temperature control system contained inside the casing, said pivot pin, said elements defining the slideway, said slotted holders and said pins for the detachable affixation of the terminals on the divided conductor plate being formed integral with said one of the parts of the two-part plastic casing.

3,852,566

FAIL-SAFE ELECTRIC WATER HEATER

Virgil P. Quirk, St. Marys, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.

Division of Ser. No. 256,757, May 25, 1972,. This application Oct. 11, 1973, Ser. No. 405,440
Int. Cl. H05b *3/16;* **F24h** *1/18*
U.S. Cl. 219—311 **6 Claims**



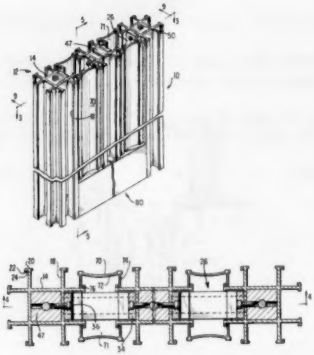
1. A fail-safe electric water heater comprising a water tank, a porous layer of heat-fused insulating material powder on the tank and adhering thereto, a porous layer of heat-fused electrical resistance material powder covering the insulating layer and adhering thereto, said resistance material having a negative temperature coefficient of resistivity, electric terminals connected to said resistance layer, dielectric material filling the pores of said porous layers, and means for electrically connecting the terminals with current-actuated circuit breaking means that will be operated by increased current flow through the resistance layer if that layer reaches a predetermined maximum temperature.

3,852,567

ELECTRIC HEATER UNIT

Roger P. Michaud, 5 McKiney Rd., Falmouth Foreside, Maine 04105, and Jacques Cordes, 30-32 Rue D'Anjov, Versailles, France (78)

Filed Jan. 9, 1973, Ser. No. 322,116
Int. Cl. F24h *9/00;* **H05b** *1/00*
U.S. Cl. 219—365 **15 Claims**



1. A heater unit comprising a plurality of elongated bars disposed in spaced generally parallel side by side relation one to the other with each bar defining a passage for containing a heating fluid, means interconnecting said bars adjacent opposite ends thereof to permit circulation of fluid from one bar to another, each of said bars having a pair of fins projecting from each of the front, rear and side faces thereof, said fins being substantially coextensive in length with said bars, means carried by said heater unit for heating the fluid adapted to circulate through said bars, a pair of elongated covers disposed between each next adjacent pair of bars and respectively adjacent the front and rear sides thereof, means for connecting said covers to said next adjacent bars whereby said pairs of covers and adjacent bars define air ducts for circulating air heated by the fluid adapted to circulate through said passages, each of said covers being generally channel-shaped in cross section, and means carried by the legs of each channel-shaped cover for securing the same to a pair of opposed side fins of the next adjacent bars.

3,852,568

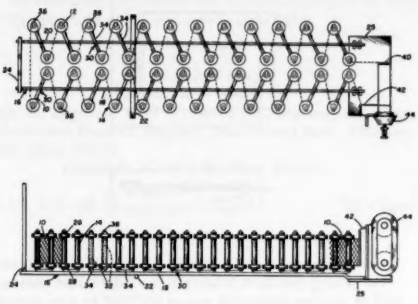
ELECTRIC RESISTANCE HEATING ELEMENT

Jack M. Clement, Tecumseh, Mich., assignor to Gould Inc., Chicago, Ill.

Filed Feb. 1, 1973, Ser. No. 328,856
Int. Cl. H05b *3/02;* **F24h** *3/04;* **H01c** *3/00*
U.S. Cl. 219—375 **8 Claims**

1. A resistance heating assembly comprising:
a. a support framework;
b. a plurality of tubular insulators supported on said framework and located at the points of direction reversal of a serpentine path;

c. means coacting between the framework and each insulator for supporting said insulators in axially fixed relation; wherein the framework includes elongated wire member means and the insulator support means include a plurality of wire members each having one portion secured to said elongated wire member means and having a free end extending into a tubular insulator;



d. a thin strip of apertured, foil-like electrical resistance material retained and supported by said insulators at intervals along the length of said strip, said strip being formed as a grid along a serpentine path; and

e. electric terminal means communicating with each extremity of said strip.

3,852,569

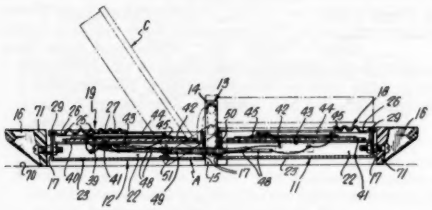
ELECTRIC GRILL

Alfred M. Potvin, Beauceville, Quebec, Canada, assignor to Heetco Ltee., Quebec, Canada

Filed Dec. 26, 1972, Ser. No. 318,558

Int. Cl. H05b *3/06*

U.S. Cl. 219—525 **2 Claims**



1. An electric grill comprising a lower and an upper grill chassis, each said grill chassis having a bottom wall, sidewalls about said bottom wall and a grill plate made of heat-conductive metal and defining an upper wall; means to removably secure each said grill plate to their respective chassis, an electrically-insulated resistive heating element in each grill chassis intermediate said bottom wall and said grill plate and supported in close proximity to said grill plate, means electrically interconnecting the heating elements of both chassis, electrical terminals in said lower chassis connected to said electrically interconnecting means and adapted to be connected to an electric power source, a sheet of heat-insulating material secured in a substantially horizontal plane and elevated from said bottom wall, a reflector plate secured above said sheet of insulating material, said sheet and reflector plate disposed between said heating element and said bottom wall, said heating element being secured onto said reflector plate, whereby heat will be reflected on said grill plate positioned in close proximity thereof, support means to support each said chassis bottom wall above a common horizontal plane, a hinge connecting said lower and upper chassis along one of their sidewalls to permit said upper chassis to be displaced through a 180° arc from a position where both said grill plates lie side by side in a common horizontal plane to a further position where both said grill plates face each other in substantially juxtaposition, each said grill chassis being of substantially rectangular shape and defining two elongated sidewalls and two end walls, said hinge having a channel member secured to each end wall of said bottom chassis adjacent the end edge of a sidewall and extending above said lower chassis grill plate, an elongated connector member secured to a sidewall of said upper chassis near each end edge thereof and extending above said upper chassis grill plate to define a connecting end, an elongated channel in said channel member extending vertically to the plane of said lower chassis grill plate, and a pin of circular transverse cross-section in said connecting end of said connector member and extending perpendicular thereto and outwardly towards a respective end wall of said upper chassis, each said pin being received within a respective channel to thereby interconnect said upper chassis of said lower chassis and permitting said upper chassis displacement and said upper chassis to be spaced a predetermined distance above said bottom chassis when juxtaposed, and further including a handle member secured to each said lower and upper chassis and located centrally of the side wall remote from the hinge.

3,852,570

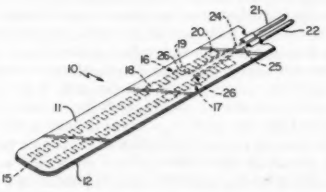
FLEXIBLE ELECTRICAL RESISTANCE HEATING ELEMENT

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 29, 1973, Ser. No. 410,539

Int. Cl. H05b *3/34*

U.S. Cl. 219—528 **10 Claims**



1. An electrical element comprising a conductor having a pair of lead attaching ends, each lead attaching end having a plurality of spaced and predetermined lead attaching parts therealong, a pair of leads respectively electrically attached to one preselected lead attaching part of each end of said conductor so that a desired electrical resistence is provided through said conductor between said leads, and an electrically non-conductive and flexible encasing structure having opposed ends completely covering said conductor and having part of one of said opposed ends covering part of said leads whereby the remainder of said leads extend from said one opposed end of said encasing structure.

3,852,571

SYSTEM OF TRANSFERRAL OF FUNDS

Bruce Wood Hall, Syosset, and Michael J. Shade, Coram, both of N.Y., assignors to Hempstead Bank, Hempstead, N.Y.

Continuation of Ser. No. 38,173, May 18, 1970,. This application Aug. 16, 1972, Ser. No. 280,984

Int. Cl. G06k *15/18, 7/08, 7/00*

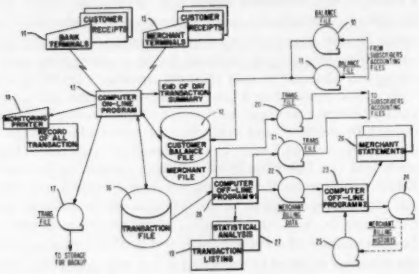
U.S. Cl. 235—61.7 B **8 Claims**

1. A system for transferring funds between customers' accounts and retail merchants' accounts comprising:

an identification card for each of a plurality of customers, each card having machine sensible identifying indicia,

input terminals at the points of sale of the retail merchants for encoding the identification of the retail merchant, the identifying indicia of the customer making a transaction and the amount to be transferred,

means at a central location for storing the customer's available balance which can be drawn against the accounts of a plurality of customers,



means at said central location for storing retail merchants' accumulated credit for the accounts of a plurality of said retail merchants,

a communication link connected to said input terminals and connected to said central location for transmitting the encoded identifying indicia and amount to be transferred from each input output terminal to said central location, a digital computer at said central location connected to said means at said central location for completing the transfer which simultaneously debits said amount against said customer's available balance and credits said amount to the identified retail merchant's accumulated credit, in response to transmission of said encoded identifying indicia and said amount to be transferred,

means for applying to said communications link a signal signifying completion of transfer only if the customer's stored available balance exceeds the amount to be transferred and for applying a signal indicating no transfer if the amount exceeds the customer's available balance, and a printer at each point of sale connected to an input terminal at that point of sale and producing a hard copy receipt recording the transaction in response to the receipt of said signal signifying completion of transfer, said receipt providing visual evidence of the transfer for comparison with the customer's statement.

3,852,572

IDENTITY CARD READER

Jean-Daniel Nicoud, Belmont, Switzerland, assignor to Sodeco/Saia, Geneva, Switzerland

Filed Jan. 3, 1973, Ser. No. 320,749

Claims priority, application Switzerland, Jan. 3, 1972, 3072/72

Int. Cl. G06k *7/10*

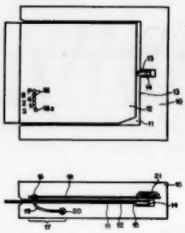
U.S. Cl. 235—61.11 E **4 Claims**

1. Card reading apparatus for reading cards having a plurality of information bearing tracks, with indicia arranged in a predetermined pattern, including a direction synchronization track and a plurality of data, tracks, the indicia being arranged in columns transverse to the information bearing tracks, comprising:

a housing having a slot arranged therein for accommodating a card, said slot having a closed end and an open end for receiving the card;

detection means for each track to detect the indicia present in each track, said detection means for the direction synchronization track being offset relative to said detection means for said data tracks;

direction indicating means including bistable means electrically coupled to said synchronization track detection means and said data detection means for producing an error signal corresponding to a particular state of said



bistable means to indicate that the card is being moved in the wrong direction relative to said detection means;

end of reading indicating means coupled to data detection means for producing a signal in response to removal of the end of the card from the slot; and

data reading means coupled to data detection means for reading the information in the data tracks.

3,852,573

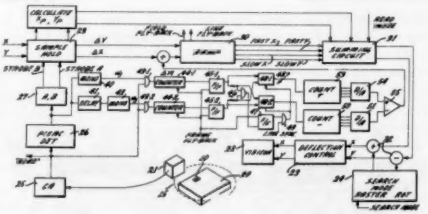
ALIGNMENT CORRECTION FOR READ SCAN RASTER FIELDS

Volker Dolch, Neu Isenburg, Germany, assignor to Scanner, Inc., Houston, Tex.

Filed Nov. 16, 1973, Ser. No. 416,372

Int. Cl. G06k *7/015, 19/06*; **G08c** *9/06*

U.S. Cl. 235—61.11 E **9 Claims**



1. In a method for preparation for reading information from a data carrier, the information being defined by contrasting data markings arranged on the carrier within a particular area on the carrier bounded by an upper and/or a lower boundary which is not necessarily delineated by a contiguous marking, whereby above the lower or below the upper boundary markings are provided having extension transverse to the boundary, there being space free from markings below the lower and above the upper boundaries, the method including providing a scanning raster defined by a scanning line extending in a first direction and shifting the scanning line in a second direction transverse to the first direction, and providing a video signal in response to scanning by means of the raster, the method further including orienting the scanning raster so that the scanning lines run at least approximately parallel to the boundaries, the improvement comprising:

providing video signal manifestation of passage of the scanning lines across at least one of the boundaries, the passage defined by passage across plural markings as preceded or succeeded by absence of such passage;

providing representation of different phases of such passages in and along the respective scanning lines for different ones of the scanning lines in the same raster field;

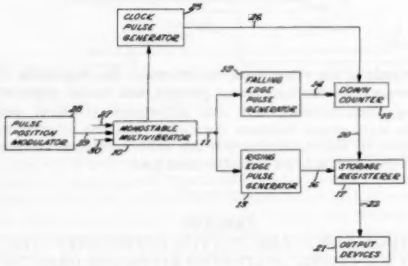
selecting a plurality of such lines in association with different phases of these lines to establish a representation of angular misalignment between the direction of the scanning lines and the direction of the boundaries; and

correcting the orientation of the raster field in accordance with the latter representation, prior to reading of the data by operation of the corrected raster field.

3,852,574
DIGITAL RATE METER

Aydin M. Bilgutay, 7424 W. Shore Dr., Minneapolis, Minn. 55424, and Ilhan M. Bilgutay, 2601 Sunset Blvd., Minneapolis, Minn. 55416

Filed Nov. 6, 1972, Ser. No. 304,021
Int. Cl. H03k *21/34*
U.S. Cl. 235—92 PL **13 Claims**



1. In a digital rate meter for approximating the frequency of a repeatable function, the repeatable function frequency being lower than a first predetermined frequency, of the type having clock pulse generator means and register means responsive to said clock pulse generator means, the improvement which comprises:

said clock pulse generator means being selectively sequentially operable at first and successive clock pulse repetition rates, said first repetition rate being substantially equal to 1/n times the increase in period resulting from a decrease in frequency from said first predetermined frequency to a second lower frequency, *n* being a constant number greater than 1, with said successive repetition rates being substantially equal to 1/n times the increase in period from successive decreases in frequency, each successive decrease in frequency being substantially equal to the decrease in frequency from said first predetermined frequency to said second lower frequency; and means responsive to said clock pulse generator means for sequentially switching said clock pulse generator means from said first repetition rate through said successive repetition rates, said switching being effected after n pulses at each repetition rate.

3,852,575
STRAPPABLE INACTIVITY TIMER FOR DATA SET

Leander Bruce Daniels, and Richard D. Fretwell, both of Columbus, Ohio, assignors to MI², Inc., Columbus, Ohio

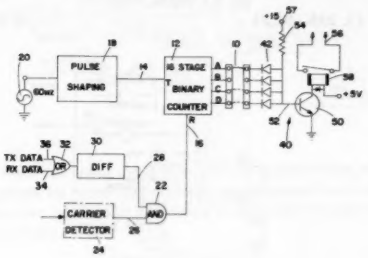
Filed Mar. 21, 1973, Ser. No. 343,206
Int. Cl. G06m *3/02*
U.S. Cl. 235—92 T **6 Claims**

1. A strappable inactivity timer for a data set, said data set being connected to a 60 Hz power source and having a carrier detector, the timer comprising:

a. a strapping terminal board having a plurality of adjacent, non-conductively connected, associated terminal pairs which are selectively connectable;

b. a multiple stage binary counter having a trigger input connected to 60 Hz pulses from said power source and having outputs of selected stages connected to one of each of said associated terminal pairs;

c. a first AND gate logic means having its output connected to a reset input of said counter having a first input connected to said carrier detector and a second input connected to the data set circuit at a node where communicated data pulses occur, for resetting said counter in response to the presence of a carrier and of data bits; and



d. decoding means having inputs connected to the other terminal of each of said associated pairs and an output connected to a clear circuit of said data set for clearing said data set in response to actuation of all of stages of said counter to which the inputs of said decoder means are selectively connected.

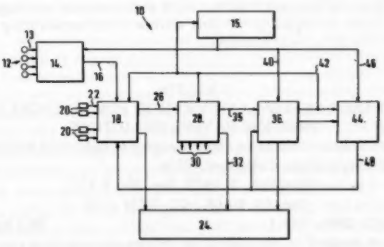
e. an OR gate having one input connected to a source of transmitted data bits and another input connected to a source of received data bits;

f. a differentiator circuit with its input connected to the output of said OR gate and its output connected to said second input of said first AND gate.

3,852,576
PREMIUM ALLOCATION DEVICE

Kenneth Norman Rudd, Eight Greenacres, London Rd., Ashington, England

Filed Mar. 29, 1973, Ser. No. 346,193
Claims priority, application Great Britain, Mar. 29, 1972, 14764/72; Feb. 7, 1973, 5986/73
Int. Cl. G07c *3/10*
U.S. Cl. 235—92 GA **13 Claims**



1. Apparatus for determining the allocation of a bonus comrising: means for registering a plurality of individual sales transactions and for providing a total indicative of the sum

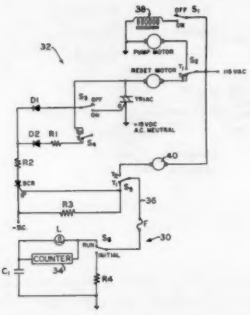
value of the individual transactions added together, means responsive when the total reaches a predetermined amount to condition the apparatus in readiness to allocate said bonus, and means for delaying the allocation of said bonus so that any customer making a sales transaction at the time that said predetermined amount is reached is prevented from receiving said bonus.

3,852,577

REMOTE VENDING CONTROL APPARATUS

Lawrence Michael Moon, and Herbert W. Timms, both of Tuscon, Ariz., assignors to Herbert W. Timms, Tucson, Ariz.

Filed Apr. 2, 1973, Ser. No. 346,843
Int. Cl. H03k *21/32*
U.S. Cl. 235—92 FL **5 Claims**



1. A remote vending control apparatus whereby a remote controller may enable and monitor the dispensing of gasoline through a solenoid control valve of a motor actuated gasoline pump having a computer for registering the amount of gasoline dispensed by a customer, comprising:

first switch means controlled by the remote controller for initially gating an SCR into a conducting state and subsequently providing a path of conduction from a signal generating source to a monitoring device;

second switch means connected to the SCR and activated by the customer for initializing the gasoline pump computer and enabling the pump to dispense gasoline; and

third switch means, connected to the first switch means by a single control wire, which is automatically actuated after the initialization of the computer for activating the solenoid control valve and pump motor and further enabling the signal generating source and connecting the signal generating source to the first switch means, the control wire carrying an initialization signal to the SCR prior to actuation of the third switch means and signals from the signal generating source to the monitoring device after such actuation.

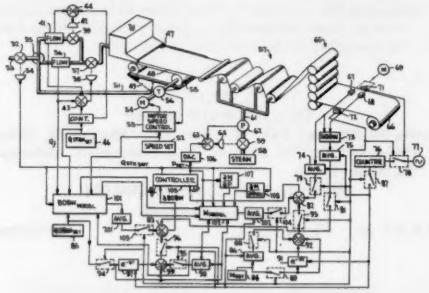
3,852,578

CONTROL SYSTEM AND METHOD FOR MACHINE OR PROCESS HAVING DEAD TIME

James S. Rice, Columbus, Ohio, assignor to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Feb. 3, 1970, Ser. No. 8,377
Int. Cl. D21d *1/20*; D21f *1/06*
U.S. Cl. 235—151.1 **56 Claims**

1. A method of controlling an output of a machine or process having a dead time between the time a control action affecting the output is taken and the time the output is affected by the control action, comprising the steps of sampling the output at discrete time intervals which are less than the dead time, deriving a signal indicative of the error between the sampled output and a set point for the output, in response to the error signal initiating control for the machine or process, providing a model of the machine or process, coupling to said model a signal indicative of the control action for the machine or process, and modifying the response of said model with the



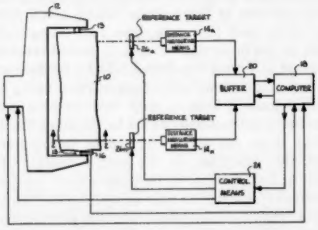
magnitude of the error signal to determine the magnitude of the control for the machine or process, said model response having characteristics such that subsequent transient and steady state errors between the output and the setpoint in response to the control action are fully corrected at time intervals which are less than the dead time.

3,852,579

METHOD AND APPARATUS FOR DETERMINING THE SURFACE CONFIGURATION OF ELONGATE OBJECTS, PARTICULARLY LOGS

Fred Sohn, Roseburg; Larry C. Hunter, and James Frederick Holmes, both of Corvallis, all of Oreg., assignors to Sun Studs, Inc., Roseburg, Oreg.

Filed Mar. 23, 1973, Ser. No. 344,175
Int. Cl. G01b *11/10*
U.S. Cl. 235—151.3 **13 Claims**



1. An apparataus for determining the surface configuration of an elongate object, such as a log, comprising:

a. means for gripping said object by its respective ends and rotating it about a longitudinal axis;

b. a plurality of distance measuring means spaced along the length of said object for scanning the circumferential contour of said object at said said respective spaced locations, while said object is being continuously rotated each of said distance measuring means comprising an optical ranging system in the form of a transceiver means for radiating light energy which is then reflected back from an opposed point on the surface of said object and processed by said transceiver to produce a data signal

descriptive of said circumferential contour at said respective spaced location; and

c. a computer for processing said data signals received from said plurality of distance measuring means to determine the surface configuration of said object.

3,852,580
HYPOTENUSE CORRECTION CIRCUIT

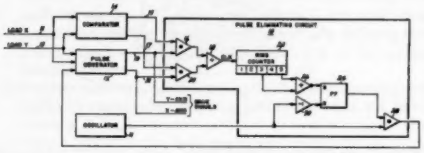
Clifford Michael Bailey, Eaton Ford, England, and Gerarous Adrianus Mous, Overloon, Netherlands, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 1, 1973, Ser. No. 411,746

Claims priority, application Great Britain, Mar. 1, 1973, 10036/73

Int. Cl. G06f *15/46, 1/02*

U.S. Cl. 235—152 **5 Claims**



1. An apparatus of the type for use in a numerical control comprised in part of a pulse generator responsive to a feedrate signal and input signals representing displacements of a movable member along at least two perpendicular axes of motion for producing periodic drive signals causing said member to move at a predetermined velocity along a predetermined path defined by said displacements, wherein the improvement comprises:

a. means for producing a pulse train representing the predetermined velocity;

b. means responsive to the input signals for comparing said signals and producing an output signal in response to an input signal representing the largest displacement;

c. means responsive to the output signal and one of the drive signals corresponding to the axis of motion having the shortest displacement for generating elimination pulses as a function of a predetermined fraction of the number of periods of the one of the drive signals; and

d. means responsive to the pulse train and the elimination pulses for producing the feedrate signal by inhibiting one pulse in the pulse train in response to each elimination pulse.

3,852,581
TWO BIT BINARY DIVIDER

Fred T. Reynard, King of Prussia; Donald E. Feldpush, Drexel Hill, and Joseph S. Schibinger, King of Prussia, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 14, 1972, Ser. No. 314,979

Int. Cl. G06f *7/52*

U.S. Cl. 235—164 **6 Claims**

1. A 2-bit, non-restore, look-ahead, binary divider, comprising:

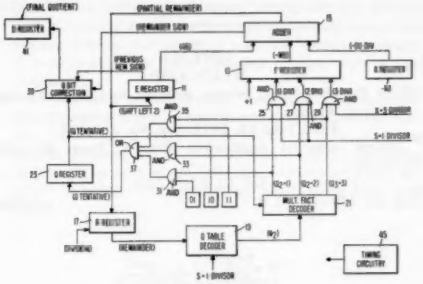
means for subtracting a multiple of the divisor from four times the remainder for providing a new remainder in each cycle of operation;

means for developing a tentative divisor multiplication factor in each cycle of operation and concurrently with the operation of said subtracting means, said developing means being tied to said subtracting means;

means for correcting said tentative factor developed, concurrently with the operation of said subtracting means, said factor correcting means being connected to said tentative factor developing means;

means for generating tentative bits of quotient in each cycle of operation, being connected to said factor correcting means; and

means for correcting said tentative quotient bits generated



in each operating cycle to corrected quotient bits, said quotient bit correcting means being connected with said tentative quotient bit generating means and said subtracting means.

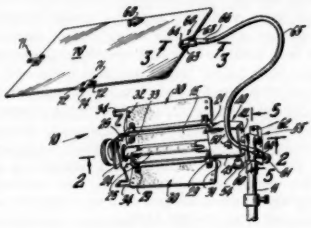
3,852,582
LIGHTING ARRANGEMENT FOR PHOTOGRAPHIC WORK

Ross Lowell, P.O. Box 114, Lincolndale, N.Y. 10540

Filed June 20, 1973, Ser. No. 371,933

Int. Cl. G03b *15/02*

U.S. Cl. 240—1.3 **20 Claims**



1. A readily portable lighting arrangement for photographic work comprising, in combination, a luminaire, including a relatively elongated reflector, as a main component; lamp mounting and connection means on said luminaire for mounting a lamp in operative relation with said reflector; and luminaire mounting means secured to said reflector, and arranged to clampingly engage a mounting post for adjustably mounting the luminaire thereon; said luminaire mounting means being formed with aperture means adapted to disengageably receive mounting elements of additional lighting arrangement components; said luminaire including a substantially rectangular panel having a highly reflecting outer surface and constituting said reflector; an inner housing member including a substantially rectangular planar base and first and second end walls bent outwardly from said base; means mounting said reflector panel on said base with at least portions of said reflector panel spaced from said base to provide passages for flow of cooling air between said panel and said base; respective lamp sockets mounted on each of said end walls and extending toward each other in alignment to receive a tubular lamp; an outer housing member having a substantially rectangular planar base extend-

ing parallel to the base of said inner housing member and having an outwardly extending wall extending in spaced parallel relation to said first end wall of said inner housing member; and means securing said housing member bases to each other in spaced parallel relation to provide a further passage for flow of cooling air between said inner and outer housing members.

3,852,583

HEADLAMP

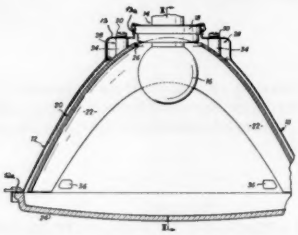
Oliver Puyplat, Paris, France, assignor to Cibil Projecteurs, Bobigny, France

Filed June 19, 1972, Ser. No. 264,194

Claims priority, application France, June 18, 1971, 71.22333

Int. Cl. F21v 7/00

U.S. Cl. 240—41.35 R **2 Claims**



1. An automobile vehicle headlamp, comprising a rigid external metallic body, a reflector within said body, said reflector having at least one parabolic reflecting area, and an electric bulb optically cooperating with said reflector to create a luminous beam, said body having a crown surrounding an opening, said crown and body being formed as a one piece element a bulb holder within said opening and secured to said crown, said bulb holder supporting said bulb, said reflector being a rigid structure formed of molded plastic material and having a central opening in registry with the opening in said body, said bulb being of such a size so as to be capable of passing freely through said opening without contacting said reflector, and means for securing said reflector to said body only in the vicinity of said openings, said securing means comprising lugs molded integral with said reflector and abutting said crown of said body, and fasteners extending through said crown into said lugs, and abutments projecting inwardly from said body near the free end of said reflector for steadying said reflector.

3,852,584

OMNIDIRECTIONAL LIGHT BEACON WITH TOROIDAL FLASH LAMP

Robert E. Levin, South Hamilton, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 22, 1972, Ser. No. 317,791

Int. Cl. F21v 7/00

U.S. Cl. 240—41.35 R **1 Claim**

1. A multidirectional light comprising:

a lamp of toroidal volume having an axis concentric with the toroidal volume and having its central plane intersected perpendicularly by the lamp axis, the lamp being curved substantially around and equidistant from the lamp axis,

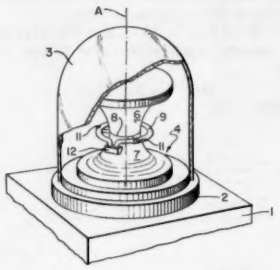
a reflector encircled by the lamp with reflecting surfaces extending substantially above and below the central plane of the lamp, and

means to mount the lamp in fixed relation thereto,

the reflector comprising a continuous surface of revolution curved around the lamp axis and defined by a generatrix of the surface intersecting the central plane of the lamp between the lamp and its axis, wherein the generatrix is defined by the equation:

$(r^2-2Dr\cos p+D^2-R^2)^{1/2}-R\tan^{-1}[(r^2-2Dr\cos p+D^2-R^2)^{1/2}/R]+R\tan^{-1}[r\sin p/(r^2\cos 2p-p2Dp\cos p+D^2)^{1/2}]-(r^2\cos^2 p-2Dr\cos p+D^2)^{1/2}-2H=0$

wherein p is the angle to a given locus on the generatrix in the vertical plane, r the variable radius to the locus, R the fixed



radius of the torodial lamp volume, D the displacement of the lamp volume center in the central plane of the lamp from the vertex of the reflector, and H a parameter dependent on reflector size, the central plane of the lamp being vertically asymmetric with respect to the vertex of the reflector so as to produce an asymmetric reflected light distribution pattern with a peak intensity close to and above the lowermost ray issuing from the reflector.

3,852,585

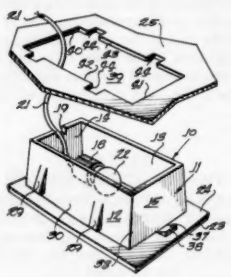
MOTOR VEHICLE LAMP UNIT

Ronald N. Brunger, Fort Wayne, Ind., assignor to International Harvester Company, Chicago, Ill.

Filed Mar. 15, 1973, Ser. No. 341,657

Int. Cl. B60q 3/02

U.S. Cl. 240—57 **9 Claims**



1. A vehicle lamp unit supported upon an interior wall panel of a vehicle body, said wall panel having an opening formed therethrough, the combination including said wall panel, comprising,

an open-ended lamp housing having means for supporting a lamp therein, the lamp housing being movable along a straight line substantially normal with respect to the wall panel to effect insertion of the lamp housing through said panel opening and placement of said lamp housing in a first position wherein a plurality of spaced, generally flat, outwardly facing wall surface portions of said lamp housing are disposed closely adjacent spaced respective edge portions of said wall panel partially defining said opening

therethrough, said lamp housing being bodily movable with respect to said wall panel from said first position to a second position along a substantially straight line wherein one of said generally flat, outwardly facing wall surface portions of said lamp housing is moved away from and is spaced from the respective edge portion partially defining said panel opening that said one of said flat, outwardly facing wall surface portion was disposed closely adjacent to when said lamp housing was in its first position;

translucent lens means integrally formed with and closing one end of said lamp housing;

a support flange integrally formed with and extending radially outwardly from said lamp housing and said lens means adjacent the periphery of said lens means, said support flange being effective to abut said wall panel when said lamp housing is in its first and second positions, said support flange being effective to bridge the space formed between said one of said outwardly facing wall surface portion of said lamp housing and said last-mentioned respective edge portion partially defining said panel opening when said lamp housing is in its second position; and

releasable securing means carried by the lamp housing and operably engageable with the wall panel when the lamp housing is in its second position to firmly connect the lamp housing to the wall panel, said releasable securing means being effective to operably engage the wall panel upon movement of said lamp housing from its first position to its second position.

3,852,586

HOUSING FOR A ROAD VEHICLE LAMP

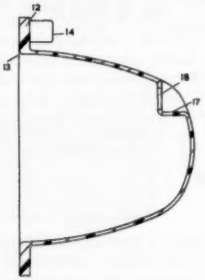
Samuel Michael Goodyer, Sutton Coldfield, and John Leslie Mulhall, Solihull, both of England, assignors to The Lucas Electrical Company Limited, Birmingham, England

Filed May 17, 1973, Ser. No. 361,246

Claims priority, application Great Britain, May 20, 1972, 23834/72; Nov. 7, 1972, 51267/72

Int. Cl. B60g *1/00*

U.S. Cl. 240—57 **7 Claims**



1. A housing for a road vehicle lamp, said housing comprising a body having a flange projecting therefrom, said flange being adapted to be secured, in use, to the bodywork of the road vehicle so as to mount the housing on the vehicle, wherein said flange is formed from a foamed, moulded synthetic resin material.

3,852,587

COMBINATION HEAD AND CASE MOUNTED LIGHT

Carlton L. Koehler, Box 236, Avalon, Calif. 90704

Filed Nov. 5, 1973, Ser. No. 412,531

Int. Cl. A42b *1/24*

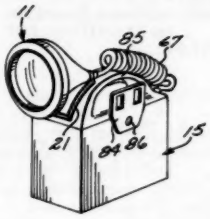
U.S. Cl. 240—60 **8 Claims**

1. Combination head and case mounted light apparatus for use iwth a flexible diver's hood which assumes various convex curvatures corresponding with the heads of wearers, comprising:

first mounting means attached to the hood and projecting forwardly and rearwardly over the top of said hood, said first mounting means being flexible so as to conform to various curvatures taken by said hood;

a light device including a housing having one side formed with a concave curvature for complementally fitting said various convex curvatures of said first mounting means; a battery-powered lamp mounted on one end of said housing;

second mounting means mounted within the concave curvature on said one side of said housing, said second mounting means being cooperative with said first mounting means in response to said first and second mounting means being pressed into oblique contact with one another to selectively mount said light device from said hood;



a battery case including battery means and an exterior convex surface for complementaally interfitting said concave curvature on said one side of said housing;

carrying means for carrying said battery case from said wearers;

third mounting means on said convex curvature of said battery case and cooperative with said second mounting means in response to being brought into oblique contact therewith to selectively mount said light device from said battery case; and

elongated electrical lead means leading from said light device to said battery whereby said hood may be worn by different wearers and will conform to the forward and rearward curvature of the heads of said wearers and said light device may be selectively mounted from said headpiece and said battery case.

3,852,588

ELECTRIC LAMP MEANS

Ollie Lee Crawford, 18 Wagner Ave., Roosevelt, N.Y. 11575

Filed Nov. 29, 1973, Ser. No. 420,260

Int. Cl. F21v *1/00*

U.S. Cl. 240—108 R **3 Claims**

1. Electric lamp means comprising means to mount an electric light,

light permeable reflective means connected to and surrounding said mounting means on all sides comprising a plurality of honeycomb panels with apertures separated by thin walls, said apertures covering a greater portion of said panels than said separating walls,

said panels being covered on all surfaces with a reflecting covering to thereby enhance the direct and indirect light emerging from said lamp.

3,852,589

READER FOR RADIOTHERMOLUMINESCENT DOSIMETER

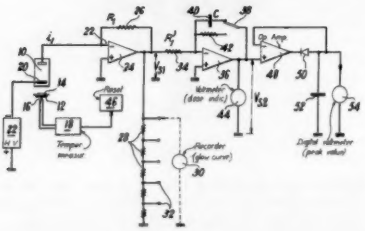
Roger Chenault, Boulogne, and Raymond Prigent, Gif-sur-Yvette, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Dec. 1, 1970, Ser. No. 94,074

Claims priority, application France, Dec. 5, 1969, 69.42147

Int. Cl. G01t *1/11, 1/20*

U.S. Cl. 250—71.5 R **4 Claims**



1. A device for reading a radiothermoluminescent dosimeter comprising: means for heating the dosimeter in accordance with a predetermined law; a transducer sensitive to the light emission of the dosimeter and delivering an electric current proportional to the light; and amplifying and measuring means, wherein said means comprise a first operational linear amplifier, a second operational amplifier, manually operable means for closing a loop including said second amplifier either on an integration capacitor or on a high value resistance, a voltmeter for measuring the output voltage of said second amplifier, said voltmeter providing the integrated light emission at the end of the heating period when said second amplifier is closed on said capacitor, a third operational amplifier, a loop associated with said third operational amplifier and comprising rectifier means, and voltage measuring means for measuring the output voltage of said diode, said first, second and third amplifiers being connected in cascade.

3,852,590

COORDINATE CONTOUR TRACER

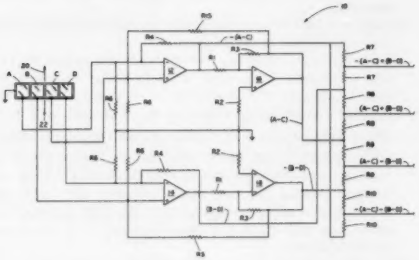
Frans Brouwer, Glencoe, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed June 6, 1973, Ser. No. 367,633

Int. Cl. G06k *11/02*

U.S. Cl. 250—202 **6 Claims**

1. For use in a contour tracing system of the type including a rotatable tracing head having a resolver rotated with said head by a steering motor to control the orientation of said head and resolver relative a longitudinally extending contour and enable said resolver to control the speed of a pair of coordinate drive motors for moving said head longitudinally along said contour, the improvement comprising a plurality of light sensitive cells of substantially equal area carried by said head, said cells arranged in adjacent juxtaposed positions with two of said cells intermediate the other of said cells, said two intermediate cells being offset from the other cells in the direction of head movement, means for combining the output of one of said intermediate cells with the output of a respective one of the other cells spaced adjacent the other intermediate cell and the output of said other intermediate cell with a



respective other cell spaced adjacent one intermediate cell to provide a respective combined output signal for each intermediate cell and respective other cell, and means enabling said combined output signals to be combined for application to said steering head motor to control said steering head motor and coordinate drive motors for moving said head and cells longitudinally along said contour.

3,852,591

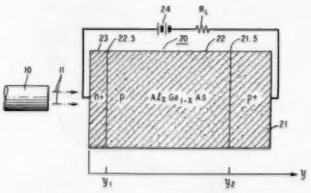
GRADED BANDGAP SEMICONDUCTOR PHOTODETECTOR FOR EQUALIZATION OF OPTICAL FIBER MATERIAL DELAY DISTORTION

Tien Pei Lee, Middletown, and Tingye Li, Rumson, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Oct. 19, 1973, Ser. No. 408,086

Int. Cl. H01j *39/12*

U.S. Cl. 250—211 J **13 Claims**



1. Apparatus for equalizing the delay distortion of optical radiation, which comprises

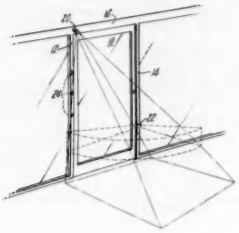
a semiconductor body portion having a graded energy bandgap terminated by a charge carrier collection means, whereby different wavelength components in said radiation incident upon the body are absorbed in the body portion at different average positions according to said wavelength, thereby producing charge carriers which drift within the body portion having the graded energy bandgap to the charge collection means, said body located in the path of the optical radiation emanating from an optical fiber in which different wavelength components of said radiation undergo different optical time delays in accordance with the material dispersion property of the fiber, said graded energy bandgap being such that the different optical time delays of the different

wavelength components in the fiber are substantially compensated by the different delays of the drifting charge carriers in the body portion generated by said wavelength components.

3,852,592
AUTOMATIC DOOR OPERATOR

Andrew E. Scoville, Ellington, and William R. Davis, West Simsbury, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed June 7, 1973, Ser. No. 367,734
Int. Cl. H01j *39/12*
U.S. Cl. 250—221 **9 Claims**



1. An automatic door operator comprising a reversible drive including a drive motor for powering a door through a door opening and door closing cycle and a traffic responsive control therefor, said traffic responsive control comprising radiant energy emitter means for emitting a divergent beam of radiant energy spanning the path of travel of traffic through the door and radiant energy detector means spaced from said emitter and having an axis of sensitivity disposed transversely of said beam of radiant energy to intersect said beam and define in the intersection thereof a discrete divergent three-dimensional control zone for sensing diffuse reflected radiant energy from traffic within said three-dimensional control zone to control the actuation of said reversible drive, said three-dimensional control zone being spaced above and having a lower boundary substantially parallel to the floor along said path of travel of traffic through the door.

3,852,593
PULSED NEUTRON CAPTURE LOGGING FOR DETERMINING RESIDUAL OIL

Joseph D. Robinson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 300,700, Oct. 25, 1972, abandoned. This application May 10, 1973, Ser. No. 359,160
Int. Cl. G01v *5/00*
U.S. Cl. 250—259 **6 Claims**

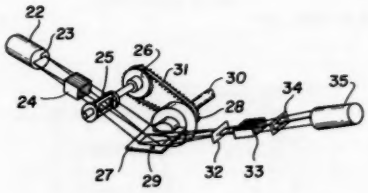
1. A method for determining the residual oil present in a formation by the measurement of decay of capture gamma activity using a pulsed neutron capture technique wherein a portion of the indigenous formation fluid is displaced by another fluid and measurements of the decay of capture gamma activity are made before and after the displacement of the indigenous formation fluid, said method comprising:

measuring said decay of capture gamma activity by counting after the production of the neutron pulse the gamma rays during two separate time intervals, the first of said time intervals starting at least 500 microseconds after the production of a neutron pulse.

3,852,594
X-RAY DIFFRACTION APPARATUS

Frank Rudolph Paolini, Stamford, Conn., assignor to Pepi Inc., New York, N.Y.

Filed July 25, 1973, Ser. No. 382,481
Int. Cl. G01n *23/00*
U.S. Cl. 250—278 **7 Claims**



1. An X-ray diffraction apparatus comprising:

a. a source of X-rays;

b. means for holding an X-ray diffraction specimen in the path of said X-ray beam such that a portion of said specimen can be impinged by said beam;

c. means for rotating said specimen at a first angular velocity from a first position to a second position;

d. a diffraction slit disposed between said specimen and said source such that said X-rays pass through the opening of said slit;

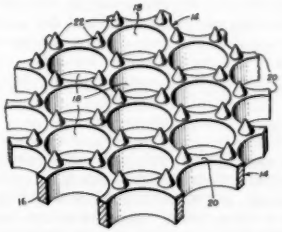
e. means for rotating said diffraction slit simultaneously with the specimen, said diffraction slit being so rotated at a second angular velocity lower than said first angular velocity; and

f. means for measuring the intensity of X-rays reflected from said specimen, whereby said irradiated portion remains substantially constant throughout the rotation of said specimen.

3,852,595
MULTIPOINT FIELD IONIZATION SOURCE

William H. Aberth, Palo Alto, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Sept. 21, 1972, Ser. No. 290,900
Int. Cl. H01j *39/36, 1/30*
U.S. Cl. 250—288 **12 Claims**



1. A field ionization source comprising a plate-like porous substrate pervious to flow of substantially all gases and a multiplicity of needle-like elements located on one surface of said substrate, said needle-like elements being highly uniform in space and uniformly spaced on said substrate.

3,852,596

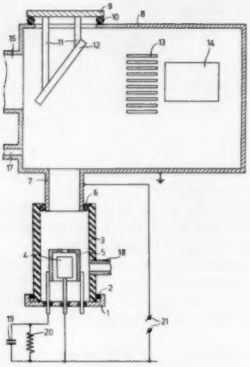
COLD CATHODE GASEOUS DISCHARGE DEVICE FOR PRODUCING ELECTRONS IN AN X-RAY FLUORESCENCE ANALYSIS APPARATUS

Eliberthus Houtman, and Jakob Gerard Siekman, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 121,392, March 5, 1971. This application Mar. 7, 1973, Ser. No. 338,869

Int. Cl. G01n *23/22*

U.S. Cl. 250—310 **8 Claims**



1. Apparatus for causing X-ray fluorescence of the surface of a material, comprising:

walls defining a first chamber, a second chamber and a straight channel connecting said chambers, said walls forming a gas tight enclosure and the walls defining said first chamber and said channel being electrically conductive;

an exhaust outlet in said first chamber for exhausting gas therefrom to establish and maintain a low gas pressure inside said enclosure, said low gas pressure being within a range suitable for establishing and maintaining a cold cathode gas discharge within said enclosure;

a non-heated cathode disposed within said second chamber opposite said channel;

means for electrically connecting between said non-heated cathode and said walls defining said channel a source of sufficiently high voltage to establish and maintain a cold cathod gas discharge between said non-heated cathode and said channel, thereby causing an electron stream to travel through said channel into said first chamber; and

means for supporting a material within said first chamber in the path of said electron stream, the surface of a material supported thereby and exposed to said electron stream being caused to X-ray fluoresce.

3,852,597

METHOD AND APPARATUS FOR OBSERVING A LOW MAGNIFICATION ELECTRON MICROSCOPE IMAGE

Takashi Yanaka, and Kohei Shirota, both of Tokyo, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1973, Ser. No. 359,669

Claims priority, application Japan, May 22, 1972, 47-50594

Int. Cl. H01j *37/26*

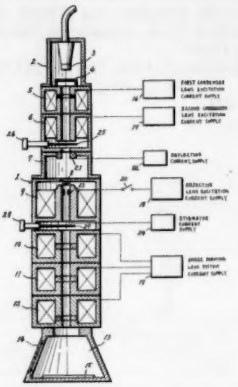
U.S. Cl. 250—311 **5 Claims**

1. A method for observing a low magnification image using a typical electron microscope having an electron beam condenser lens system including one or more lenses, and a projector lens system including an objective lens and one or more intermediate lenses arranged in sequential order along the optical axis of the microscope, an imaging means and means for adjusting the excitation current to the lens comprising the steps for:

A. keeping the specimen arranged between the objective lens magnetic gap fixed;

B. disconnecting the objective lens excitation current;

C. replacing the final stage condenser lens aperture by an aperture having a diameter of at least 0.5mm;



D. inserting a contrast aperture in the electron beam path adjacent the intermediate lens on the object side thereof;

E. adjusting the current in the condenser lens system so as to form a focal point at the contrast aperture; and,

F. adjusting the current in the projector lens system to focus a low magnification image on the imaging means.

3,852,598

SCINTILLATION CAMERA WITH IMPROVED RESOLUTION

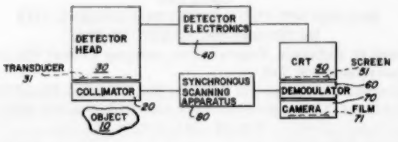
Agne Larsson, Barytongatan 13, 421 38 Vastra Frolunda, Sweden

Filed Nov. 21, 1972, Ser. No. 308,539

Claims priority, application Sweden, Nov. 23, 1971, 14953/71

Int. Cl. G01t *1/20*

U.S. Cl. 250—327 **6 Claims**



1. In combination:

a radiation detector, including a radiation sensitive transducer, of the type producing an output representing spatial coordinates of interaction of a quantum of radiation with said transducer;

a collimator mounted on said detector adjacent said transducer comprising a regular array of separated channels for radiation quanta;

a documentation medium; and

demodulation means receiving said output of said detector operative to produce on said documentation medium a documenting spot at a position comprising a mirror image

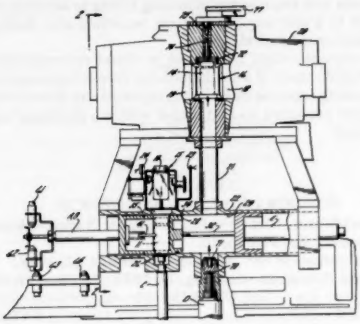
reversal of said spatial coordinates of interaction with respect to a central axis of one of said channels traversed by said quantum of radiation.

3,852,599

VIAL TRANSFER MECHANISM

Roy E. Smith, Villa Park, Ill., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed July 9, 1973, Ser. No. 377,392
Int. Cl. G01t 1/00
U.S. Cl. 250—328 **7 Claims**



1. A device for transferring samples from a sample changer to a measurement chamber and for thereafter returning said samples to the sample changer after a measurement period, comprising:

a sample changer accessible through the bottom thereof,

a vertical sample transferring conduit extending to said chamber,

a horizontal sample transferring conduit extending to said vertical sample transferring conduit,

a sample-receiving carriage movable in said horizontal sample transferring conduit between a sample receiving position near said sample changer and a position beneath said vertical sample transferring conduit, and means for sequentially (a) transferring a sample from said sample changer to said sample-receiving carriage, (b) moving said carriage from its sample-receiving position to its position beneath said vertical sample transferring conduit, (c) elevating said sample from said carriage into said sample chamber, and means for moving said sample back to said sample changer in a reverse sequence.

3,852,600

X-RAY METHOD AND APPARATUS FOR DETECTING MISLOCATION OF STEEL REINFORCEMENTS IN GREEN TIRES

John E. Faulkner; J. Richard Hansen, both of Pittsburgh, and Eugene G. Vaerewyck, Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 21, 1973, Ser. No. 334,513
Int. Cl. G01t 1/20
U.S. Cl. 250—360 **7 Claims**

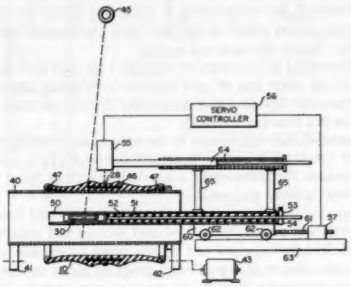
1. A method of inspecting a green tire for misalignment of metal reinforcing elements embedded therein, comprising the steps of:

marking a reference stripe at a particular widthwise location around the circumference of the green tire while yet remaining on the collapsible forming drum on which it was fabricated,

placing the stripe-marked tire on rotary means for turning it about its central axis,

directing penetrative radiation radially through a peripheral portion thereof while disposed on said rotary means,

detecting the intensities of such radiation transmitted through the tire discretely at a plurality of select widthwise detector locations of such tire relative to said stripe, comparing the intensities so detected to give information



with respect to location of the aforesaid metal reinforcing elements, and

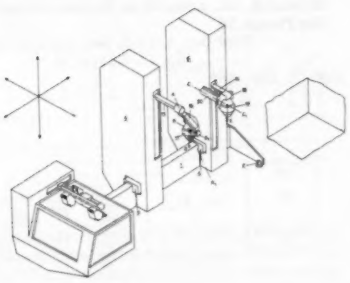
tracking the reference stripe on the tire during its rotation to automatically maintain the positional relationship between stripe and detector locations.

3,852,601

SCANNING DEVICE FOR SCINTIGRAPHY ACCORDING TO THREE ORTHOGONAL PLANES

Renato Casale, Rome, Italy, assignor to Ital Elettionica S.p.A., Rome, Italy

Filed July 7, 1972, Ser. No. 269,668
Claims priority, application Italy, July 15, 1971, 51666/71
U.S. Cl. 250—366 **6 Claims**



1. In a device for scintographic scanning according to three orthogonal planes employing two detecting heads arranged for adjustment along, above and transversely of a longitudinal and horizontal beam position the improvement comprising;

a beam horizontally disposed in said position,

two vertical column structures including chain means for moving the same along said beam;

two recording devices;

frame support means mounted fixedly on said beam including longitudinally extending carriage guide means and transverse guide means;

a horizontally disposed recording surface mounted on said frame parallel to said guide means;

chain drive means for moving said carriage along said horizontally extending and transverse guide means respectively;

two column carriages mounted for vertical movement along

said columns, respectively, having means for moving the same vertically along the columns;

each last said carriage including rod means for supporting a detector head for horizontal transverse scanning motion in respect to the support carriage, a first said rod means in one column including a bracket on an outer end thereof for supporting a detecting head in rotatable movement about an inclined axis, the bracket being rotable about the first rod means;

a detecting head rotatably mounted on said first rod means at an outer end of said bracket for varying displacement beneath first said rod means and toward the other column as the bracket rotates;

a second said rod means in the other said column including a rotatable knuckle at an other end thereof comprising means for supporting a second detecting head beneath said second rod means;

a second said detecting means mounted on said knuckle for rotation about the axis of said second rod means;

said first and second rod means being adjustable vertically and independently of each other by chain means extending vertically in said columns and horizontally along said beam by further chain drive means operative to move said columns therealong, said detecting heads being rotatively adjustable to detect in like directions vertically and horizontally, said bracket inclinable relative to said first rod means to align said detecting heads horizontally or vertically;

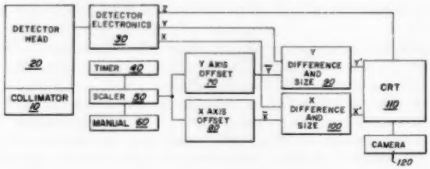
means operating said chain means for moving the columns and said chain drive means being selectively operable for effecting desired three plane scanning motions; and

means coupling each recording head drive means to effect motion thereof corresponding to scanning motion of said detecting head.

3,852,602
SCINTILLATION CAMERA WITH RAPID SEQUENCE IMAGING DEVICE

Richard F. Gramm, Ellicott City, Md., and Philip W. Walton, Richmond, Va., assignors to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed Dec. 4, 1972, Ser. No. 312,231
Int. Cl. G01t 1/20
U.S. Cl. 250—369 **4 Claims**



1. A radiation imaging and visual display device for displaying plural images of a radioactive object, each image representing radioactive distribution in said object during a different time interval within a measurement period, comprising:

a. radiation imaging means including a radiation sensitive transducer operative to produce pairs of electrical signals respectively representing X and Y directional components of interactions of quanta of radiation therewith in a two dimensional co-ordinate system,

b. a cathode ray tube connected to said radiation imaging means and equipped with a screen and generating an electron beam impinging upon said screen and including beam deflection circuitry acting upon said electron beam in mutually perpendicular directions to which the aforesaid X and Y directions correspond to receive said pairs of electrical output signals and to display a flash of light of temporary duration on said screen in response to each of said pairs of electrical output signals,

c. electron beam biasing means acting upon the aforesaid beam deflection circuitry to advance the electron beam in stepwise fashion across the screen in the aforesaid mutually perpendicular directions to a plurality of separate and mutually exclusive image recording areas on said screen,

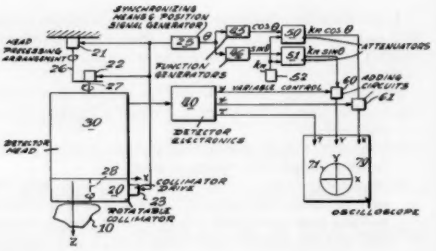
d. timing means controlling said electron beam biasing means to cause the aforesaid beam to produce flashes of light only within a single one of said image recording areas for a predetermined time interval and to thereafter actuate said electron beam biasing means to advance said beam to a next sequential image recording area during a measurement period, and

e. photographic film positioned in visual communication with said screen of said cathode ray tube for permanently recording separate images each representing those flashes of light produced on said screen within a particular time interval.

3,852,603
TOMOGRAPHIC IMAGING DEVICE

Gerd Muehllehner, Glenview, Ill., assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.

Continuation of Ser. No. 806,449, March 12, 1969, abandoned. This application Aug. 24, 1973, Ser. No. 391,330
Int. Cl. G01t 1/20
U.S. Cl. 250—369 **3 Claims**



1. Apparatus for imaging a volume distribution of radionuclides in an object comprising, in combination:

a radiation detector, including a radiation sensitive transducer, of the type producing outputs representing position coordinates in a planar coordinate system parallel to said transducer of quanta of radiation interacting with said transducer;

collimating means interposed between said transducer and said object for defining a substantially uniform radiation acceptance direction for each elemental area of said transducer;

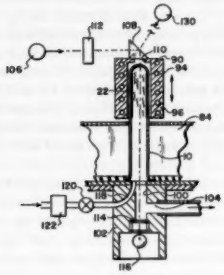
driving means for synchronously changing said radiation acceptance direction of said collimating means and the relative spatial positions of said detector and said object to produce in said transducer stationary images of quanta of radiation emanating from a preselected focal plane through said object and parallel to said transducer, and moving images of quanta of radiation emanating from other parallel object planes passing through said object, said moving images having predetermined patterns differing according to the depth of the associated plane through said object, and

image converting means coupled to said driving means and to said detector for converting selected outputs from said transducer in accordance with said predetermined patterns of moving images into a stationary image display of quanta of radiation emanating from a preselected object plane other than said focal plane.

3,852,604
MERCURY ANALYSIS SYSTEM AND METHOD

Walter M. Grengg, Madison, Wis., assignor to Pollution Control Technology, Inc., Madison, Ill.

Filed Aug. 11, 1972, Ser. No. 279,820
Int. Cl. G01n *21/26*
U.S. Cl. 250—373 **33 Claims**



1. A method for analyzing the concentration of mercury in a fluid including the steps of: placing a given amount of a fluid sample in a vessel having a predetermined interior side surface area coated with a noble metal which has a strong affinity for mercury, such that at least a portion of the mercury in said sample is adsorbed by said noble metal coating; removing said sample from said vessel; positioning said vessel in a generally upright position with a first end of said vessel above a second end of said vessel and with said second end vented; heating said vessel to a given temperature to release mercury vapor from said noble metal coating; passing endwise through said vessel an ultraviolet light of a wave length band which is absorbed by mercury vapor; measuring the amount of said light transmitted through the mercury vapor laden air within said vessel; flushing said mercury vapor laden air from said vessel with mercury-free air; passing said ultraviolet light endwise through said vessel having mercury-free air therein; measuring the amount of said light transmitted through said mercury-free air; and comparing the first light transmission measurement with the second light transmission measurement, the difference between said measurements being indicative of the concentration of mercury in said fluid sample.

3,852,605
CONTROL CIRCUITRY FOR PREVENTING DAMAGE TO THE TARGET OF A SCANNING X-RAY GENERATOR

Eiji Watanabe; Eizo Kato; Takayuki Shimomura; Takashi Ito; Koichiro Nakamura, and Tadashi Fujii, all of Tokyo, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Akishima-shi, Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,071
Claims priority, application Japan, Dec. 27, 1972, 48-2159
Int. Cl. H05g *1/54*
U.S. Cl. 250—401 **10 Claims**

1. A scanning X-ray generating apparatus comprising,

a. an electron beam generating source,

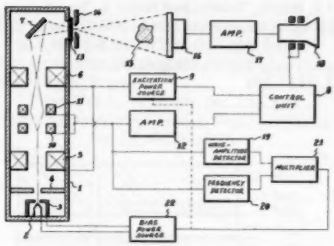
b. means for focussing the generated electron beam,

c. a target for generating X-rays by scanning the electron beam thereover,

d. an electron beam deflecting means for scanning the electron beam over said target,

e. a circuit for supplying deflection signals to said electron beam deflecting means.

f. means for obtaining signals indicative of the travelling rate of the electron beam scanning the target by detecting variations of said deflecting signals, and

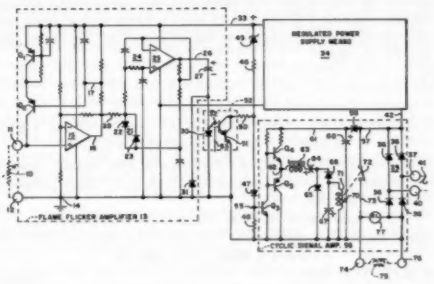


g. means for controlling the electron beam in response to said obtained signals to prevent damage to the target.

3,852,606
FLAME DETECTION SYSTEM UTILIZING A RADIATION COUPLING

John L. Kabat, Bloomington, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Oct. 12, 1973, Ser. No. 406,078
Int. Cl. G02f *1/28*
U.S. Cl. 250—551 **10 Claims**

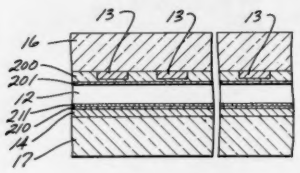


1. A fuel burner control system which is adapted to respond to the resistance variations of photocell means exposed to a flame in a fuel burner, including: power supply means having voltage output means; flame flicker amplifier means energized from said voltage output means and having an input adapted to be connected to said photocell means with said amplifier means being capable of amplifying said resistance variations which are representative of the presence of flame; said amplifier means including output circuit means having flicker frequency coupling means and radiation emitting means which emits a flickering radiation when said flame is sensed; voltage divider means including radiation responsive impedance means connected to said voltage output means; said radiation responsive impedance means varying in impedance in response to said radiation of said radiation emitting means; cyclic signal amplifier means having input means connected to said voltage divider means to respond to variations in current flow in said voltage divider means as said radiation responsive impedance means varying with said flickering radiation from said radiation emitting means; and said cyclic signal amplifier means having output means which is energized only in response to the presence of said flame as represented by said flickering radiation from said radiation emitting means.

3,852,607
MULTIPLE GASEOUS DISCHARGE DISPLAY/MEMORY PANEL HAVING THIN FILM DIELECTRIC CHARGE STORAGE MEMBER

Harold J. Hoehn, Toledo, and Roger E. Ernsthausen, Luckey, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 21, 1973, Ser. No. 399,548
Int. Cl. H01j *61/30, 65/04*
U.S. Cl. 313—201 **3 Claims**

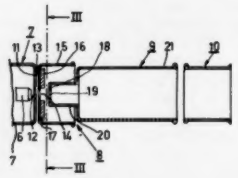


1. In a gaseous discharge display/memory device comprising an ionizable gaseous medium in a sealed gas chamber formed by a pair of opposed charge storage members backed by electrode members, the improvement wherein at least one charge storage member, consisting of at least two thin continuous dielectric layers, has an effective thickness ranging between about 250 angstrom units and about 150,000 angstrom units, the minimum thickness being sufficient to store charges without deteriorating upon gas discharge and the maximum thickness being less than that thickness at which said charge storage member becomes discontinuous due to breakdown caused by deposition originated stresses, said charge storage member having a first layer of silicon oxide and at least one additional layer selected from the oxides of Al, Ti, Zr, Hf, Pb, and Group IIA.

3,852,608
CATHODE-RAY TUBE HAVING AN ASTIGMATIC LENS ELEMENT IN ITS ELECTRON GUN

Johannes Hendricus Maria Johanns, and Jan Hasker, both of Emmasingel, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 126,425, March 22, 1971, abandoned. This application Nov. 27, 1972, Ser. No. 309,710
Int. Cl. H01j *29/02, 29/56*
U.S. Cl. 313—449 **3 Claims**



1. A cathode ray tube for color television, comprising:

a. an evacuated envelope having a window at one end thereof;

b. a screen disposed at said window and comprising electron-responsive luminescent areas emitting light of various colors;

c. means for scanning an electron beam across said luminescent screen in the direction from a first side thereof toward an opposite side;

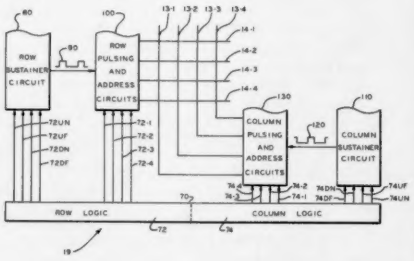
d. electron gun means within said envelope for producing an electron beam, said electron gun comprising a cathode and at least a first, second, and third grids, said first and second grids respectively controlling and accelerating said electron beam, said second grid having a surface portion facing said first grid and said third grid having a first surface portion remote from said cathode and facing toward said luminescent screen, said electron gun further comprising plate means comprising an astigmatic lens element located between said surface portion of said second grid and said first surface portion of said third grid, said astigmatic lens element being a rotationally non-symmetric passage through which said electron beam passes and which has two main axes which are orthogonal with respect to each other and with respect to the axis of said electron gun, the dimension of said passage along one of said main axes significantly exceeding that along the other said axis and said one axis being substantially parallel to said scanning direction of said electron beam; and

e. a shadow mask having a plurality of apertures extending therethrough located between said luminescent screen and said electron gun, and having said apertures disposed at said electron-responsive areas that are accessible to said electron beam via said apertures, said shadow mask being substantially parallel to and proximate with said luminescent screen, whereby there is a reduced incidence of visible moire fringes resulting from interference between a pattern of lines on said luminescent screen scanned by said electron beam and a pattern of said apertures arranged along lines on said color selection electrode.

3,852,609
CONTROL APPARATUS FOR SUPPLYING OPERATING POTENTIALS

Edwin F. Peters, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 8, 1972, Ser. No. 313,448
Int. Cl. H05b *37/00*
U.S. Cl. 315—169 TV **5 Claims**



1. In a system for supplying operating potentials to a load device wherein at least two transversely oriented conductors are dielectrically isolated from a gas discharge medium between said two conductors, comprising

a. means for applying a load sustaining potential having at least two different potential levels to one of the transverse conductors including a parallel path having at least two branches, a first branch having a first unidirectional device connected therein for permitting current flow in a first direction, a second branch having a second unidirectional device connected therein for permitting current flow in a second direction;

b. means for applying a load signal potential across the end connections of said parallel path;

c. transistor means having a base-emitter junction, a collector-base junction, a collector electrode, a base electrode,

and an emitter-electrode and having an emitter-collector circuit connected in one of said branches to permit current flow in the same direction as the unidirectional device in that branch so as to control current flow in said one branch;

d. means for applying a turn-on signal to the base-emitter junction of the transistor means having a magnitude which is sufficient to drive said transistor means into saturation and allow current flow through the emitter-collector circuit thereof; and

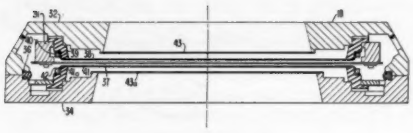
e. means for establishing a reverse bias on the collector-base junction of said transistor means including means for applying a reverse bias signal to said base-emitter junction, isolating diode means connected to prevent current flow between the collector electrode and the base electrode of the transistor means in response to collector potentials that would establish a forward bias across said base-emitter junction and permitting flow of current from said reverse bias signal across said collector-base junction in a reverse direction to discharge th minority carriers from said saturated junction to enable said transistor means to turn off quickly, and means for connecting a reverse bias source to said reverse bias applying means.

3,852,610

TRANSMISSION ION CHAMBER

Raymond D. McIntyre, Los Altos Hills, Calif., assignor to Varian Associated, Palo Alto, Calif.

Filed Feb. 26, 1973, Ser. No. 335,633
Int. Cl. G01t 1//18
U.S. Cl. 250—385 **29 Claims**



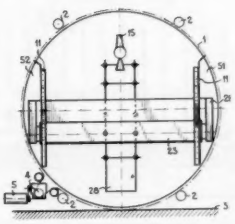
1. In a particle accelerator system including means for forming and projecting a beam of charged particles along a substantially linear path, and target means disposed in said beam path for developing a radiation field upon being struck by said charged particles: ionization chamber means disposed in said radiation field and including a housing member; an insulative support sheet mounted within said housing member, said insulative support sheet having first and second oppositely facing surfaces; first electrode means comprising a film of conductive material secured to at least a portion of one of said surfaces of said insulative support sheet and positioned in superimposed parallel relationship with respect to said one of said surfaces; second electrode means spaced apart from said first electrode means, said second electrode means comprising a sheet of conductive material supported by said housing member in spaced parallel relationship with respect to said conductive film of said first electrode means; third electrode means comprising a film of conductive material secured to at least a portion of the other of said surfaces of said insulative support sheet and positioned in superimposed parallel relationship with respect to said other of said surfaces; fourth electrode means spaced apart from said third electrode means, said fourth electrode means comprising a sheet of conductive material supported by said housing member in spaced parallel relationship with respect to said conductive film of said third electrode means; and enclosure means supported by said housing member for maintaining an ionizable gas in the spaced region between said electrode means.

3,852,611

RADIODIAGNOSTIC APPARATUS INCLUDING A PIVOTABLE X-RAY TABLE

Jean Cesar, Paris, France, assignor to Compagnie Generale De Radiologie, Paris, France

Filed May 1, 1973, Ser. No. 356,139
Claims priority, application France, May 5, 1972, 72.16106
Int. Cl. G03b 41//16
U.S. Cl. 250—445 **7 Claims**

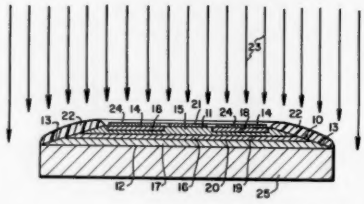


1. Radiodiagnostic apparatus for X-ray and, in particular, tomographic examinations of a patient, including: a fixed base; a ring-shaped support located in a vertical plane and mounted on said base for rotation about a horizontal first axis coinciding with that of the ring; two parallel circular arcuate arms extending perpendicularly to and having one of their ends secured integrally to said ring-shaped support at diametrically opposite locations thereof, said arcuate arms being located symmetrically in relation to the first axis and the centers of their radii defining a second axis perpendicular to said first axis; a pair of first carriages respectively mounted on said arcuate arms for simultaneous parallel displacements therealong; first motor means for controlling said displacements of said first carriages; rigid beam-shaped supporting means parallel to said second axis fixedly interconnecting said first carriage pair; a second carriage mounted on said beam-shaped supporting means for independent translational displacements therealong; fork-shaped supporting means fixedly mounted on said second carriage having at their respective ends a pair of first and second concentric shafts both coaxial with said second axis, said first shaft pair being the outer one; panel-shaped patient supporting means having ends respectively secured to said first shaft pair for rotation therewith about said second axis; second motor means carried by said second carriage for driving said first shaft pair in rotation; third motor means carried by said second carriage for driving said second shaft pair in rotation, said second shaft pair being coupled to means for displacing said panel-shaped supporting means in parallel to itself; a third carriage mounted on said beam-shaped supporting means for independent translational displacements therealong parallel to the displacements of said second carriage; plate-shaped supporting means mounted integrally with said third carriage and extending away from said beam-shaped means to the opposite side relatively to said fork-shaped means; an elongated supporting system mounted on said plate-shaped means for omnidirectional pivoting about a plane parallel thereto; an X-ray source and an X-ray image receiver means respectively articulatedly mounted to both ends of said elongated system for respective location on either side of a patient placed on said panel-shaped supporting means, said X-ray source emitting an X-ray beam whose axis always intersects with said second axis and is incident on the center of said image receiver means; whereby the center of gravity of the assembly carried by said first carriage pair will always be located in the vicinity of said beamshaped means.

3,852,612
SELECTIVE LOW LEVEL IRRADIATION TO IMPROVE BLOCKING VOLTAGE YIELD OF JUNCTIONED SEMICONDUCTORS

John S. Roberts, Export, and Michael W. Cresswell, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 285,165, Aug. 31, 1972, abandoned.
This application Feb. 1, 1974, Ser. No. 438,931
Claims priority, application Belgium, Aug. 10, 1973, 532273
Int. Cl. H01j *37/00*
U.S. Cl. 250—492 A 4 Claims



1. A method of increasing the blocking voltage of certain semiconductor devices without significantly increasing the forward voltage drop comprising the steps of:

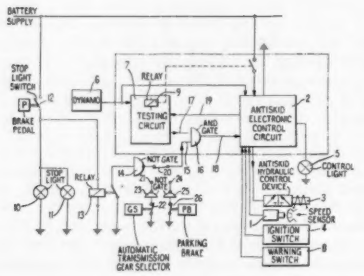
a. positioning a semiconductor body containing the semiconductor device with a major surface of the body to be exposed to a radiation source;

b. thereafter increasing the blocking voltage of the semiconductor device without significantly increasing the forward voltage drop by selectively irradiating the semiconductor body to a low level of exposure corresponding to an exposure of less than 1×10^{13} electrons/cm² with 2-Mev electron radiation.

3,852,613
ARRANGEMENT TO TEST THE OPERATION OF AN ANTISKID SYSTEM

Franz Josef Wienecke, Oberstedten, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Aug. 23, 1973, Ser. No. 391,170
Int. Cl. B60t *8/00*
U.S. Cl. 307—10 R 8 Claims



1. An arrangement to test the operation of an antiskid control system contained in a motor vehicle prior to moving the vehicle comprising:

a hydraulic brake system having stop lights;

a parking brake;

an automatic transmission gear selector having a park position;

an ignition switch;

an antiskid control system having an electronic control circuit and a hydraulic control device;

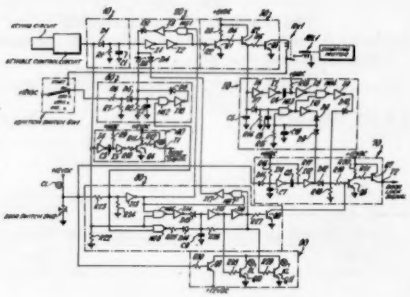
a testing circuit actuated by said ignition switch to produce a testing signal to cause said electronic control circuit and said hydraulic device to go through one entire cycle of antiskid operation; and

a circuit arrangement coupled between said electronic control circuit and said testing circuit and to said hydraulic brake system, said parking brake and said gear selector to enable said testing signal to be coupled to said electronic control circuit only upon occurrence of one or more of any of the following conditions; said hydraulic brake system being inoperative, said parking brake being operative, and said automatic transmission gear selector being set to said park position.

3,852,614
DUAL-MODE SECURITY CIRCUIT FOR AUTOMOTIVE VEHICLES AND THE LIKE

Paul A. Carlson, New Providence, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Nov. 23, 1973, Ser. No. 418,683
Int. Cl. H02g *3/00*
U.S. Cl. 307—10 AT 32 Claims



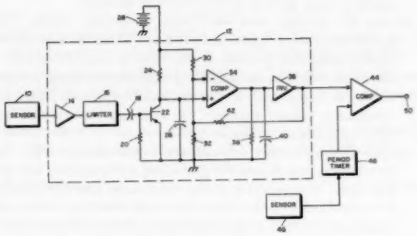
1. In a vehicle comprising a keyable control means operative when keyed to generate a control signal, a multi-position ignition switch having at least OFF, ON and START positions, at least one door switch, at least one door lock/unlock means, and engine starting means, the improvement comprising: dual-mode security circuit means operative in the security mode in response to said control signal (1) to actuate said at least one door lock/unlock means so as to unlock the associated door and (2) to enable energization of said engine starting means by actuation of said multi-position ignition switch to the START position within a predetermined period of time after the actuation and de-actuation of said at least one door switch, said dual-mode security circuit means being switched to the key mode of operation upon actuation of said at least one door switch and subsequent generation of said control signal, said dual-mode security circuit means being operative in the key mode to enable energization of said engine starting means by actuation of said multi-position ignition switch to the START position, said dual-mode security circuit means being switched back to the security mode by generation of said control signal.

3,852,615
Patent Not Issued For This Number

3,852,616
FREQUENCY SELECTION BY PERIOD TIMING

Ralph W. Carp; Harold E. Weissler, II, both of Newport News, Va., and Gale F. Krawczak, Grafton, Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 21, 1973, Ser. No. 334,330
Int. Cl. H03k 17/00
U.S. Cl. 307—233 10 Claims



4. A period timer for use in an adaptive braking system for wheeled vehicles for generating an output signal when the speed of a sensed wheel falls below a first speed and wherein said output signal is extinguished when the speed of the sensed wheel subsequently exceeds a second, higher, speed comprising:

means for generating an electrical wave having a pulse repetition frequency proportional to the speed of the sensed wheel;

a d-c power supply;

a charge storage means including a capacitor and connected across said d-c power supply for supplying charges to said capacitor whereby the voltage across said capacitor is caused to change from a first level toward a second level;

means responsive to a predetermined cyclically recurring point on said electrical wave for temporarily shunting said capacitor;

a voltage divider connected across said d-c power supply for generating a reference voltage level proportional to said first speed; a retriggerable one-shot;

a comparator for triggering and retriggering said one-shot when the instantaneous value of the voltage across said capacitor attains said reference level, a resulting signal from said one-shot comprising said output signal; and,

feedback means responsive to said output signal for changing the structure of said voltage divider so that the voltage level of said reference voltage level is altered to be proportional to said second speed during the period of said output signal.

3,852,617
APPARATUS FOR LEVEL SHIFTING INDEPENDENT OF SIGNAL AMPLITUDE HAVING A PASSIVE PEAK DETECTOR

Nikola Vidovic, Sunnyvale, Calif., assignor to International Video Corporation, Sunnyvale, Calif.

Filed Jan. 2, 1973, Ser. No. 320,092
Int. Cl. H03k 17/00
U.S. Cl. 307—235 4 Claims

1. Level shifter apparatus comprising a transistor having an emitter, base and collector,

means for applying an input signal to be level shifted between said emitter and ground,

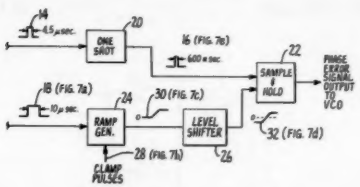
capacitor means connected between said collector and ground,

resistor means connected between said base and ground,

voltage divider means connected between said collector and ground,

differential means for subtracting a first signal voltage from a second signal voltage,

means connected to said voltage divider means for applying



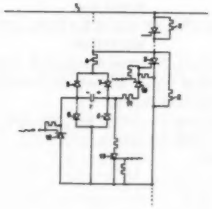
the voltage thereat to said differential means as said first signal voltage, and

means for further applying said input signal to said differential means as said second signal voltage.

3,852,618
THYRISTOR INITIATING DEVICE FOR HIGH VOLTAGE D.C. LINE

Jacques Dutilloeil, Mont-Sur-Marchienne, Belgium, assignor to Acec (Ateliers de Constructions Electriques de Charleroi, Charleroi, Belgium

Filed June 25, 1973, Ser. No. 373,485
Claims priority, application Belgium, June 28, 1972, 4156
Int. Cl. H02m 1/08
U.S. Cl. 307—252 Q 5 Claims



1. A converting circuit comprising:

a. a plurality of series connected thyristors, each thyristor having a cathode, an anode and a gate, and each thyristor connected in a control circuit comprising:

b. resistive means connected for shunting said thyristor,

c. rectifying bridge means connected to the cathode and anode of said thyristor,

d. capacitive means connected to said bridge circuit for triggering said thyristor,

e. a first optically controlled switching element connected between one side of said capacitive means and the gate of said thyristor,

f. a second optically controlled switching element connected to the other side of said capacitive means and to the cathode of said thyristor, and

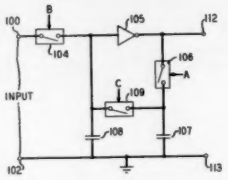
g. means for simultaneously activating said first and second optically controlled switching elements,

whereby said capacitive means is charged when said thyristor is non-conducting and discharged through said first and second optically controlled switching elements for triggering said thyristor.

3,852,619
SIGNAL SHAPING CIRCUIT

Robert Lawrence Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed July 9, 1973, Ser. No. 377,590
Int. Cl. H03k 5/01
U.S. Cl. 307—268 22 Claims

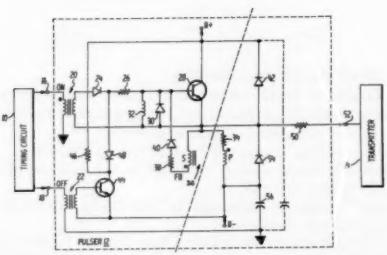


1. A signal shaping circuit comprising means for receiving samples of an input signal in periodically recurring time intervals, first and second storing means, coupling means having an input connected to said first storing means and an output, first means for applying the signal in said first storing means to said second storing means through said coupling means during a first portion of said time interval, second means for separately applying a sample of said input signal from said receiving means to said first storing means during said first portion, and third means operative during the remainder of said time interval for interconnecting said first and second storing means to combine the signal sample in said first storing means with the coupled signal previously applied to said second storing means whereby the signal at said coupling means output is modified in a predetermined manner with respect to said input signal.

3,852,620
ELECTRICAL PULSE GENERATING CIRCUIT AND METHOD

Walter E. Milberger, Severna Park, and Donald C. Lewns, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 31, 1972, Ser. No. 276,342
Int. Cl. H03k 5/12, 5/01
U.S. Cl. 307—268 17 Claims



1. A circuit for intermittently energizing a wave energy transmitter comprising:

first and second semiconductor means each including first and second electrodes and a control electrode for controlling current flow between the first and second electrodes;

means including positive signal feedback means operatively connected to the control electrode of said first semiconductor means to drive said first semiconductor means into saturation in response to the application of a first trigger signal to the control electrode of said first semiconductor means and to hold said first semiconductor means in saturation;

circuit means including said second semiconductor means operatively connected to the control electrode of said first semiconductor means, said circuit means being operable to drive said first semiconductor means from saturation into a nonconductive condition in response to the application of a second trigger signal to the control electrode of said second semiconductor means;

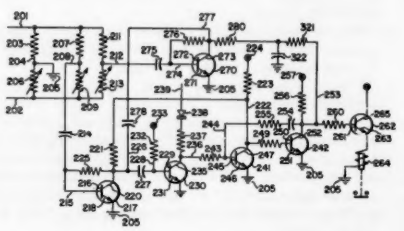
means for driving said first semiconductor means from saturation into a nonconductive condition at a predetermined time, said predetermined time being subsequent to the expected time of arrival of said second trigger signal and prior to the time when current flow in said first semiconductor means exceeds the current capacity of said first semiconductor means; and,

output circuit means operatively connected to said first semiconductor means for providing a transmitter energizing signal responsively to the saturation and nonconductive conditions of the said first semiconductor means, the amplitude of said energizing signal being independent of the amplitude of said trigger signals and the duration of said energizing signal being substantially equal to the spacing between corresponding portions of said first and second trigger signals.

3,852,621
MULTIVIBRATOR HAVING TWO LEVELS TRIGGERING CAPABILITY AFTER INITIATION

Basil M. Lide, Pittsburgh, and Harry Kowalcheck, West Newton, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 453,692, May 6, 1965,. This application Apr. 30, 1970, Ser. No. 31,807
Int. Cl. H03k 3/10
U.S. Cl. 307—273 2 Claims



1. Multivibrator apparatus comprising, in combination, an input transistor adapted to have the bias on an input terminal thereof varied, the input transistor being normally biased at a first predetermined value whereby an input signal of at least a first predetermined amplitude is required to produce a usable output signal at an output terminal of the input transistor, a multivibrator circuit including operatively connected first and second transistors and time constant means, the first transistor input terminal being operatively connected to said output terminal of the input transistor whereby a usable output signal from the input transistor causes the signal level at an output terminal of the multivibrator to change from a first state to a second state, the multivibrator remaining in the second state for a time period determined by the time constant of the time constant means and thereafter returning to the first state, and bias varying means including other time constant means connecting said output terminal of the multivibrator to said input terminal of the input transistor for altering the bias

on the input transistor while the multivibrator is in the second state and remaining for at least a predetermined time interval after the multivibrator returns to the first state so that an input signal small in amplitude compared to the first predetermined input signal amplitude at the input transistor will produce a usable output signal and cause the multivibrator to switch from he first state to the second state.

3,852,622

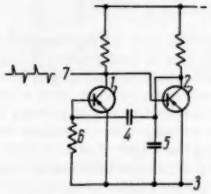
MONOSTABLE MULTIVIBRATOR CONTROLLED BY A TRAIN OF SIGNALS OF A DIFFERENT POLARITY

Marina Sergeevna Belitskaya, Ploschad Iskusstv, 5, kv. 38, and Lev Nikolaevich Volkov, prospekt Engelsa, 7, kv. 181, both of Leningrad, U.S.S.R.

Continuation of Ser. No. 114,118, Feb. 10, 1971, abandoned. This application Mar. 21, 1973, Ser. No. 343,380

Int. Cl. H03k *3/10*

U.S. Cl. 307—273 **1 Claim**



1. A monostable multivibrator controlled by a train of positive and negative input pulses, said multivibrator comprising a first and second transistor; a capacitor connected between the base of said first transistor and the collector of said second transistor; a common junction with the emitters of said transistors being directly connected thereto; a second capacitor connected between the collector of said second transistor and said common junction; a resistor connected between the base of said first transistor and said common junction; and conductor means coupled to the collector of said first transistor and the base of said second transistor for receiving the train of positive and negative input pulses, whereby output pulses from said multivibrator have their start and termination adjustably fixed in time and synchronized with various ones of the train of input pulses.

3,852,623

TIMING CIRCUIT

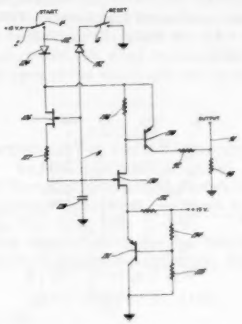
Robert E. Nelson, and Oran A. Watts, III, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 227,811, Feb. 22, 1972,. This application July 12, 1973, Ser. No. 378,800

Int. Cl. H03k *17/26*

U.S. Cl. 307—293 **2 Claims**

1. A timing circuit comprising, in combination, a first FET having its source connected to an input signal line; a resistor and a capacitor connected in series between the drain of the FET and a source of datum potential; a second FEt, the gates of both FET's being connected to the junction between the resistor and capacitor, so that the capacitor is charged by a constant controlled current and the potential on the gate of the second FET rises linearly with time when the signal line is energized; a second resistor connecting the source of the second FET to the input signal line; a source of constant potential intermediate the signal and datum potentials connected to the drain of the second FET; and an output line connected to the junction between the second resistor and the



source of the second FET, the second FET energizing the output line at a predetermined level of charge on the capacitor.

3,852,624

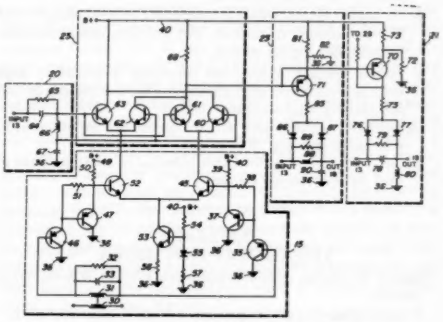
PHASE SHIFTING NETWORK

Charles J. Marik, Chicago; Bernard Shlachter, Morton Grove, and William H. Slavik, Palos Hills, all of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Division of Ser. No. 240,407, April 3, 1972,. This application Sept. 7, 1973, Ser. No. 395,216

Int. Cl. H03k *5/00*

U.S. Cl. 307—295 **5 Claims**



1. A control circuit comprising:

a direct current voltage supply terminal;

an impedance connected between an input and an output for providing a first phase shift in a signal applied to the input;

a pair of oppositely poled diodes direct current connected in series circuit across said impedance;

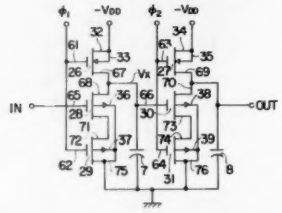
control means connected between the junction of said pair of diodes and said direct current voltage supply terminal for selectively applying a forward biasing electrical energy across said diodes; and

said diodes altering the value of said impedance upon being forward biased to provide a second phase shift in a signal applied to the input.

3,852,625
SEMICONDUCTOR CIRCUIT

Masaharu Kubo, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 30, 1973, Ser. No. 346,310
Claims priority, application Japan, Apr. 3, 1972, 47-32651
Int. Cl. H03k *17/60, 19/08*
U.S. Cl. 307—304 **14 Claims**



1. A semiconductor circuit, comprising:

a first field-effect transistor of the N-channel type and a second field-effect transistor of the P-channel type each of which has a gate, a source, a drain and a substrate;

an input circuit which includes at least one transistor adapted to effect switching in response to an input signal, and which has an input terminal for coupling said input signal to said transistor and first and second output terminals;

a capacitor, one terminal of which is connected to said drain of said first transistor;

means for coupling said drain of said first transistor to the first output terminal of said input circuit;

means for connecting said drain of said second transistor to the second output terminal of said input circuit;

a first voltage source for supplying a relatively low voltage, which is commonly connected to said source and substrate of said first transistor;

pulse supply means which is connected to said gates of said first and second transistors, and which supplies predetermined clock pulses thereto;

a second voltage source for supplying a relatively high voltage, which is commonly connected to said source and substrate of said second transistor;

at least one input source which supplies the input signal to said input terminal of said input circuit; and

means for connecting the other terminal of said capacitor to said second voltage source.

3,852,626
LINEAR INDUCTION MOTOR

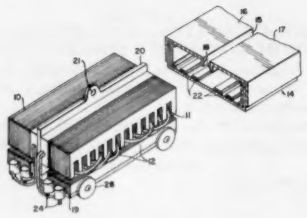
Murray W. Davis, 20501 Woodmont, Harper Woods, Mich. 48225

Continuation-in-part of Ser. No. 176,087, Aug. 30, 1971, abandoned. This application Mar. 9, 1973, Ser. No. 339,738
Int. Cl. H02k *41/02*
U.S. Cl. 310—13 **14 Claims**

1. In a linear induction motor including primary field windings, an elongated metal channel having an upper, flat base, the base having a central slit extending the full length thereof to form a pair of co-planar strips with the strips thus forming secondary conductors, and means for electrically energizing the primary field windings, the improvement comprising:

two flat, plate-like, primary cores of magnetically permeable material, each arranged above one of said coplanar strips and each of said primary cores having a plurality of transverse slots with the slots in each primary core opposing and aligned with a corresponding slot in the other primary core, and further having one set of primary field windings linking both primary cores without end turns therebetween by extending from a slot in one primary core directly to the opposed, aligned corresponding slot in said other primary core,

two flat, plate-like secondary cores of magnetically permeable material, each arranged below one of said coplanar strips and aligned beneath one of said primary cores with each secondary core having substantially the same surface area as its aligned primary core,



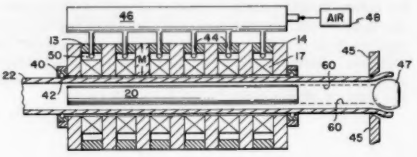
means extending through said slit and between said strips for rigidly spacing one of said primary cores from the other and for interconnecting both of said primary cores and both of said secondary cores to form a unit,

whereby upon the energization of said primary field windings to cause the primary core-secondary core unit to move linearly along the length of said channel, the alignment of said cores establishes only usable magnetic flux paths from each primary core to its aligned secondary core.

3,852,627
COMPOSITE STATOR CONCENTRIC LINEAR INDUCTION MOTOR

Murray W. Davis, 20501 Woodmont, Harper Woods, Mich. 48225

Filed Apr. 9, 1973, Ser. No. 349,227
Int. Cl. H02k *41/02*
U.S. Cl. 310—13 **13 Claims**



1. A converging flux, concentric linear induction motor especially adapted for moving rotor means, over long distances, said rotor means having a generally circular cross-section and a length greatly exceeding its diameter, said motor comprising:

a hollow, cylindrical stator member made of a material of high magnetic permeability and positioned to surround said rotor means concentrically;

said stator member including a plurality of annular teeth having teeth faces, said teeth being longitudinally spaced apart to define annular slots therebetween;

a plurality of energizable coils positioned in said slots and concentrically surrounding said rotor means, and

a discrete facing on said teeth faces, said discrete facing being of a material having a higher magnetic permeability and saturation level than said stator member, said discrete facing being of a radial thickness sufficient to prevent magnetic saturation of both said discrete facing and said stator member;

whereby upon energization of said coils, said small diameter rotor means is moved axially by the generation of increased rotor forces without magnetic saturation of the stator member or said discrete facing or rotor means.

3,852,628

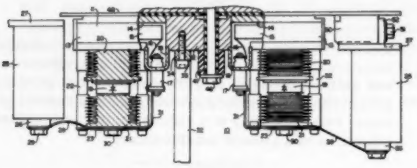
RECTIFIER ASSEMBLY FOR BRUSHLESS EXCITATION SYSTEMS

Andrew J. Spisak, Bethel Park, and Thayer L. Dillman, North Versailles, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 11, 1972, Ser. No. 287,923The portion of the term of this patent subsequent to Mar. 20, 1990, has been disclaimed.

Int. Cl. H02k *11/00*

U.S. Cl. 310—68 D **16 Claims**



1. In a brushless excitation system including an alternating current exciter and a rotating rectifier assembly having a rectifier wheel mounted on a shaft and insulated therefrom, a rectifier module adapted to be mounted on said wheel, said module comprising conducting base means, two diode assemblies, each of said diode assemblies having a disc-type rectifier diode disposed between two heat sinks in electrical and thermal contact therewith, one heat sink of each diode assembly engaging the base means and the two diode assemblies being disposed so that the diodes are of opposite polarity with respect to the base means, spring means for applying force to the other heat sink of each diode assembly to maintain contact between said one heat sink and the base means and between the diode and the heat sinks of each assembly, a fuse adjacent each diode assembly, means for electrically connecting each fuse separately to the adjacent diode assembly, and means for making electrical connection to the base means.

3,852,629

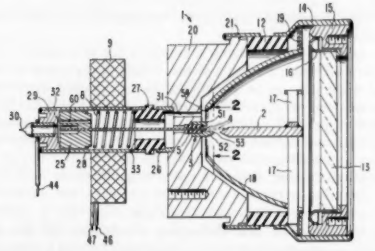
OFFSET STINGER FOR ARC LAMP

William R. Stuart, San Carlos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Dec. 13, 1973, Ser. No. 424,399

Int. Cl. H01j *61/00*

U.S. Cl. 313—152 **11 Claims**



1. An arc lamp comprising a sealed envelope containing an ionizable gas, first and second electrodes mounted in fixed positions in said envelope, each fixed electrode having an apical end portion spaced apart from an apical end portion of the other fixed electrode to form an arc gap therebetween, a stinger electrode movably mounted in said envelope, means for moving said stinger between a first position in contact with a surface portion of said first fixed electrode to a second position away from contact with said first fixed electrode, said surface portion of said first fixed electrode being located at other than the apex of the apical end portion thereof.

3,852,630

HALOGEN CONTAINING HIGH-PRESSURE MERCURY VAPOR DISCHARGE LAMP

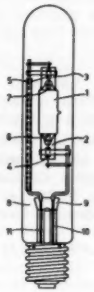
Gustaaf Adolf Wesselink, and Hendrik Roelofs, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,256

Claims priority, application Netherlands, Mar. 20, 1972, 7203720

Int. Cl. H01j *61/20, 61/22*

U.S. Cl. 313—228 **7 Claims**



1. A high-pressure mercury vapour discharge lamp comprising a discharge vessel whose wall is subjected to a power of between 10 and 100 W per sq.cm. during operation of the lamp and consisting of a rare gas as an ignition gas, at least one of the halogens iodine, bromine and chlorine, from 0.5 to 40 mg of mercury per cubic cm of content of the discharge vessel, such a quantity of sodium in the form of sodium halide that unevaporated sodium halide is present during operation, from 0.25 to 25 percent by weight of thallium calculated on the quantity of mercury and from 0 to 15 percent by weight of indium calculated on the quantity of mercury, wherein the discharge vessel furthermore contains calcium in a quantity of between 1 and 30 percent by weight of the quantity of mercury and that the quantity of halogen is at least equal to the chemical equivalent of sodium and calcium present and is not more than twice the chemical equivalent of sodium, calcium, thallium and indium present.

3,852,631

INCANDESCENT LAMP AND BASE

Melvin W. Evans, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

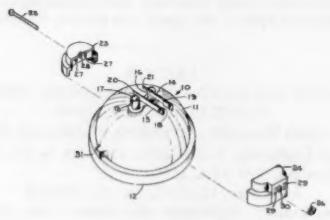
Filed Aug. 20, 1973, Ser. No. 389,974

Int. Cl. H01j *5/48, 5/50*

U.S. Cl. 313—318 **7 Claims**

1. An electric lamp comprising a glass envelope, an energy translation device connected to lead-in conductors which are hermetically sealed to said envelope, wherein the improvement comprises a base structure comprising contact prongs attached to the lead-in conductors and extending away from said lead-in conductors in both directions, said contact prongs comprising socket prongs at one end and a predetermined length extended away from said lead-in conductor at the other

end, and two base sections made of insulating material, one of said base sections containing a hole and at least one alignment slot for receiving at least one of said predetermined lengths of said contact prong, said alignment slot formed as an indentation in the wall of said first base section, said alignment slot not extending through the wall of said first base section, said



other base section containing two through openings for receiving said contact prongs and a hole in alignment with the hole of said first base section, said holes adapted to receiving a clamping means, and a clamping means inserted in and through said holes to firmly hold said base sections together.

3,852,632

PHOTOCATHODE HAVING AN INTERMEDIATE LAYER BETWEEN ITS CARRIER AND ITS LUMINOUS LAYER

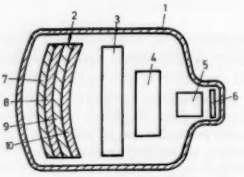
Karl Franz, Erlangen; Hermann Christgau, Furth, and Aribert Stachowiak, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 10, 1972, Ser. No. 270,341

Claims priority, application Germany, July 12, 1971, 2134762

Int. Cl. H01j *31/50*

U.S. Cl. 313—380 **9 Claims**



1. A photo cathode, comprising a carrier layer, an intermediate layer carried by said carrier layer and consisting of a deformable material, a luminous layer carried by said intermediate layer and a photo cathode layer carried by said luminous layer.

3,852,633

GRIDDED ELECTRON GUN

Gordon T. Hunter, Mountain View, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Dec. 13, 1972, Ser. No. 314,660

Int. Cl. H01j *29/00*

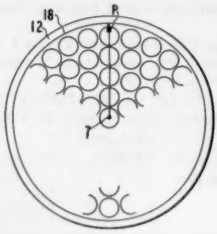
U.S. Cl. 313—411 **6 Claims**

1. In a gridded electron gun:

thermionic cathode emitter means having a concave cathode emitting surface for providing a copious supply of electrons;

anode electrode means spaced from said concave cathode emitting surface and having a central aperture in axial alignment with said concave cathode emitting surface for drawing a beam of electrons from said cathode through said central aperture in said anode;

concave control grid means interposed between said concave cathode emitting surface and said anode means, said concave control grid means including a plurality of beam passageways therethrough of generally uniform cross-sectional area defining electrostatic focusing lenses for



focusing said electrons into individual beamlets passable therethrough, said individual focusing lenses of said control grid increasing in length from the outer periphery toward the center of said control grid, said control grid means being operative at a varying control grid potential relative to said cathode emitter means.

3,852,634

SWITCH DEVICE FOR POINT SELECTOR ELECTRODES IN FLAT TELEVISION SCREENS

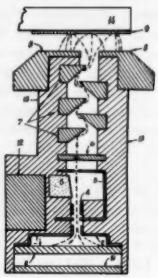
Ludwig Sullos, Acevedo 1439, Banfield, Buenos Aires, Argentina

Filed Feb. 12, 1973, Ser. No. 331,443

Claims priority, application Argentina, Feb. 17, 1972, 240578

Int. Cl. H01j *29/74, 29/56*

U.S. Cl. 313—422 **2 Claims**



1. Deflection apparatus for flat imaging screens, comprising in combination:

a. a cathode and focusing electrodes for generating a flat electron beam having a width substantially equal to that of the image to be produced, two deflecting electrodes positioned on opposite sides of the path of said flat beam and in parallel relationship to said focusing electrodes, one of said deflecting electrodes being of resistive material and having two terminals by which current may be applied through said one deflecting electrode to flow in a direction perpendicular to the electron flow in said flat electron beam, and an electrode disposed in parallel relationship to said deflecting electrodes on the side thereot remote from said cathode and having a slit parallel to said deflecting electrodes;

b. multiplier electrodes having a length substantially the same as that of said deflecting electrodes and being dis-

posed in parallel relationship to said slit, said multiplier electrodes being followed by a terminal collector anode of the same length;

c. a row of tabs disposed in parallel relationship to said multiplier electrodes and having respective secondary emission surfaces in position be be impinged successively by said flat electron beam as the beam is narrowed and undergoes deflection in the direction of said row under the influence of said deflecting electrodes, each tab being electrically connected to one end of a respective one of a plurality of image control grids arranged in a common plane without touching each other and lying perpendicular to said row, the opposite ends of said image control grids being coupled by way of resistive means to a common terminal; and,

d. a duplication of (a), (b) and (c) wherein the common planes of the two pluralities of image control grids are adjacent and parallel, with said pluralities being mutually perpendicular to form a matrix of image control grids, said matrix being adapted to be disposed in non-contacting relationship to and between transparent photoluminescent and photoemissive plane parallel surfaces equal in size to that of the image to be produced so as to control the impingement of electrons emitted from the photoemissive surface upon the photoluminescent surface.

3,852,635
TRANSIT-TIME AMPLIFIER TUBE WITH STABILIZED DELAY

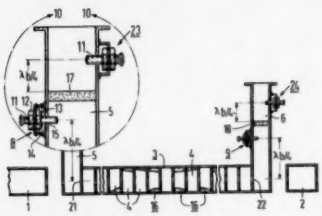
Hinrich Heynisch, Graefelfing, Germany, assignor to Siemens Aktiengesellshaft, Berlin & Munich, Germany

Filed July 6, 1973, Ser. No. 377,017

Claims priority, application Germany, July 31, 1972, 2237694

Int. Cl. H01j *25/34*

U.S. Cl. 315—3.5 **18 Claims**



1. A transit-time amplifier tube comprising an input wave guide, an output wave guide, a delay line coupled between said input wave guide and said output wave guide and at least one adjustable wave reflector arranged outside of said delay line for adjusting the frequency-dependent gain, said wave reflector positioned in one of said wave guides outside of said delay line.

3,852,636
KLYSTRONS

Christopher John Edgcombe, Cambridge, England, assignor to English Electric Valve Company Limited, Essex, England

Filed Oct. 11, 1973, Ser. No. 405,545

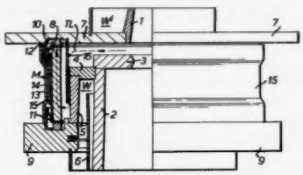
Claims priority, application Great Britain, Oct. 11, 1972, 4675/72

Int. Cl. H01j *23/20*

U.S. Cl. 315—5.54 **7 Claims**

1. In a klystron structure of the type including a high frequency interaction section terminating in a last drift tube, said interaction section operating over a selected frequency band, a collector section spaced from said last drift tube to define a gap through which high frequency radiation within said frequency band tends to escape, a sleeve-like insulating member surrounding an end of said collector section and interposed between said sections to preserve evacuated condition within said klystron structure, a transmission line having at least a first section defined between said last drift tube and said collector section and leading radially outwardly of said gap and an end section extending parallel to the axis of the klystron structure, and high frequency short circuit means connected to said end section for providing a high frequency short circuit located externally of said klystron structure, the improvement wherein:

said end section of the transmission line is defined by a metallic film in surrounding contiguous relation to said



insulating member and a tubular metallic surface within the evacuated interior of said klystron structure, and said metallic surface being spaced to provide a dielectric within and along the length of said end section of said transmission line which is constituted partially by said insulating member and partially by the vacuum within the klystron structure, said end section being so dimensioned that said transmission line is of electrical length which is an integral number (including unity) of half wavelengths of the center frequency of said frequency band and also does not correspond to an electrical length approximately to an odd number (including unity) of quarter wavelengths of any frequency or of the second harmonic of any frequency within said frequency band.

3,852,637
ELECTRON GUN STRUCTURE WITH UNIPOTENTIAL AND BIPOTENTIAL LENS

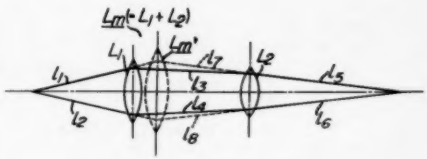
Eiichi Yamazaki, Ichihara, and Hiromi Kanai, Mobara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1972, Ser. No. 220,641

Claims priority, application Japan, Feb. 5, 1971, 46-4232

Int. Cl. H01j *29/56*

U.S. Cl. 315—16 **9 Claims**

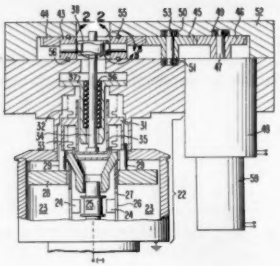


1. In an electron gun structure having a plurality of electrodes for focusing an electron beam on a screen, the improvement comprising a main focusing lens assembly comprising first electrode means for forming a unipotential electron lens and second electrode means for forming a bipotential electron lens.

3,852,638
DITHER TUNED MICROWAVE TUBE

Richard C. Stoke, Sunnyvale, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 14, 1974, Ser. No. 450,964
Int. Cl. H01j *25/50*
U.S. Cl. 315—39.61 **4 Claims**



1. In a dither tuned microwave tube:

cathode emitter means for emitting a stream of electrons;

microwave circuit means disposed adjacent said cathode emitter means in electromagnetic wave energy exchanging relation with the stream of electrons;

means for applying an anode potential to said microwave circuit means relative to said cathode means for drawing the stream of electrons from said cathode means towards said microwave circuit means and for generating wave energy on said microwave circuit means as a result of the electromagnctic wave interaction between the fields of said microwave circuit and the electrons of said electron stream;

tuning means for displacing electromagnetic fields of said microwave circuit means for tuning of said microwave circuit means and thus the frequency of the wave energy generated on said microwave circuit means;

said tuning means including, a tuning structure movable relative to said microwave circuit for variably displacing fields of said microwave circuit, tuner actuator means coupled to said tuning structure for effecting reciprocal rectilinear translation of said tuning structure, and motor means for imparting rotary motion to said actuator means for actuation thereof;

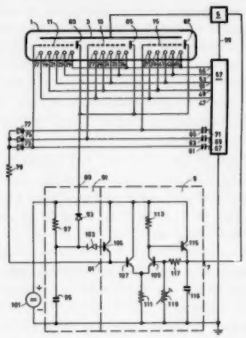
said tuner actuator means including cam means having a circular cam track to receive a cam follower means, said circular cam track being scalloped in a direction normal to the mean plane of the circular cam track, and cam follower means following said circular scalloped cam track to derive reciprocal rectilinear translation of one of said cam means relative to said microwave circuit means, and means for coupling said reciprocating one of said cam means to said tuning structure to effect reciprocal rectilinear translation thereof.

3,852,639
VISUAL DISPLAY APPARATUS

Willem Aling, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed May 7, 1973, Ser. No. 357,649
Claims priority, application Netherlands, June 17, 1972, 7208319
Int. Cl. H05b *41/36*
U.S. Cl. 315—84.6 **14 Claims**

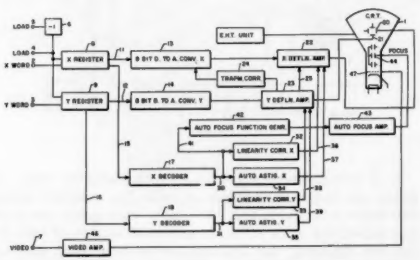
1. A visual display apparatus comprising, a gas discharge display tube including an extinction voltage measuring electrode and a system of anode and cathode electrodes arranged to define a plurality of discharge gaps within said display tube, a bias control circuit for controlling the supply voltage applied to the electrodes of the gas discharge tube, means for selectively applying the supply voltage to the tube electrodes in a sequence that is independent of the gas discharge condition across the discharge gaps between the tube electrodes, and an extinction voltage measuring circuit coupled to an input of said bias control circuit to provide a reference voltage therefor, said extinction voltage measuring circuit including a capacitor coupled to said extinction voltage measuring electrode so that the measuring electrode is arranged as a recharge electrode for the capacitor.



3,852,640
CATHODE RAY TUBE CIRCUIT

Brian D. McCarthy, Oxted, England, assignor to Sanders Associates, Inc., South Nashua, N.H.

Continuation-in-part of Ser. No. 129,824, March 31, 1971, abandoned. This application Sept. 17, 1973, Ser. No. 398,038
Int. Cl. H01j *29/70*
U.S. Cl. 315—276 D **7 Claims**

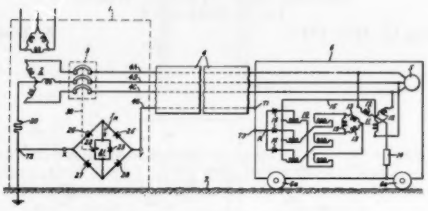


1. A cathode ray tube circuit having first and second means for generating *x* and *y* beam deflection signals, respectively, to provide a raster scan, a connection for coupling a signal proportional to the *y* deflection signal to the *x* deflection signal generating means to modify the *x* deflection signal according to the *y* deflection signal thereby to provide a correction for the trapezium distortion of an image on the screen that might otherwise occur, first and second digitally operated control means connected for controlling the said first and second beam deflection signal generating means respectively, a decoder having an input connected to the output from one of the control means and a function generator having an input connected to the output from the decoder and an output providing a signal for modifying a control signal for a cathode ray tube beam.

3,852,641
PROTECTIVE SYSTEM FOR MOBILE ELECTRIC POWER APPARATUS

Charles H. Titus, Newtown Square, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Feb. 5, 1973, Ser. No. 329,455
Int. Cl. H02h 1/02
U.S. Cl. 317—18 B 4 Claims



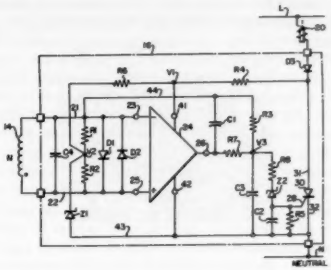
1. In a system for supplying three phase electric current through a power circuit including a flexible cable from a fixed source location to a mobile utilization apparatus having a conductive frame, a three phase power transformer at said source location having line and neutral terminals, a ground terminal at said source location conductively connected to said neutral terminal, said cable including line conductors connected to said line terminals and a ground conductor, an electrical load device carried by said conductive frame and having load terminals connected for energization to said line conductors, the electrical neutral of said load device normally floating at a voltage near ground potential under balanced load conditions, a potential transformer mounted on said frame and having wye-connected primary windings connected to said load terminals and secondary windings, said potential transformer primary windings having a neutral terminal normally floating electrically, a wye connected zig-zag autotransformer mounted on said frame, said zig-zag autotransformer having phase windings connected to said secondary windings and a neutral terminal conductively connected to said neutral terminal of said potential transformer primary windings, a three phase rectifier energized from intermediate voltage phase winding taps on said zig-zag transformer phase windings and having a common terminal connected to said conductive frame, means connecting one end of said ground conductor to said frame, and means including a low impedance signal relay connecting the other end of said ground conductor to said ground terminal at said source location, whereby a unidirectional monitor signal current supplied by said rectifier normally traverses said ground conductor and said relay and follows a return path through said power transformer neutral terminal and the neutral terminal and phase windings of said zig-zag transformer.

3,852,642
SENSING AMPLIFIER AND TRIP CIRCUIT PARTICULARLY FOR GROUND FAULT CIRCUIT INTERRUPTER

Joseph C. Engel; Robert T. Elms, both of Monroeville, Pa., and John J. Misencik, Shelton, Conn., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1972, Ser. No. 302,949
Int. Cl. H02h 3/28
U.S. Cl. 317—18 D 24 Claims

1. Electronic apparatus comprising: a source of sensed signals; amplifier means receiving sensed signals directly from said source; means to supply to said amplifier means an operating supply that is a half-wave rectified voltage; and a sold

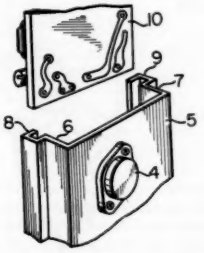


state switching device responsive to a predetermined output of said amplifier means to result in a change of conductive state.

3,852,643
PRINTED CIRCUIT BOARD ASSEMBLY AND HEAT SINK

Hideki Seki, Saijo; Sachinori Furuya, Ibaragi, and Mamoru Hiroyasu, Saijo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 6, 1973, Ser. No. 330,099
Claims priority, application Japan, Feb. 7, 1972, 47-13737
Int. Cl. H05k 7/20
U.S. Cl. 317—100 4 Claims



1. A printed circuit board assembly comprising a radiator member of square shape carrying directly heat producing components, a pair of bent boards having a certain width formed by bending opposite ends of said radiator member, and a pair of grooves provided on said pair of opposing bent boards and having a width slightly greater than the thickness of a slightly curves printed circuit board, said slightly curved printed circuit board being attached to said radiator member by inserting opposite ends of said printed circuit board into said pair of grooves.

3,852,644
PRINTED WIRING CIRCUIT GUARD RING

Helmut G. Seidler, Schwenksville, and James T. Walker, Norristown, both of Pa., assignors to Philco-Ford Corporation, Blue Bell, Pa.

Filed June 22, 1973, Ser. No. 372,593
Int. Cl. H05k 5/00
U.S. Cl. 317—101 C 2 Claims

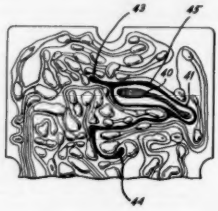
1. A printed wiring circuit board for mounting a group of electronic components and interconnecting said components to form an electronic circuit, said board comprising:

an insulating substrate,

an array of conductors disposed on said substrate, said array being contoured to complete the interconnections between said components to achieve said circuit,

a first conductor in said array interconnecting elements of said components to form a point operating at an impedance that is high relative to the impedance normally encountered at other points in said circuit, and

a second conductor in said array adjacent to and surrounding said first conductor, said second conductor being connected to a source of potential approximating the potential at said point.



3,852,645

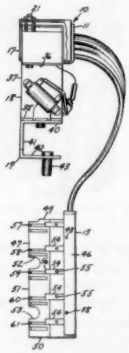
TELEPHONE RELAY REPAIR KIT WITH SPACED CONTACT BOARDS

Paul V. DeLuca, Port Washington, N.Y., assignor to Porta Systems, Corp., Syosset, N.Y.

Filed July 23, 1973, Ser. No. 381,801

Int. Cl. H02b *1/04*

U.S. Cl. 317—113 **3 Claims**



1. In combination, an inoperative telephone flat spring relay including a plurality of rows of contacts separated by interstices selectively opened and closed by an armature operated by a relay coil, device and a device for repairing said inoperative relay comprising: a replacement relay, means for mounting said replacement relay in the area of said relay coil, a plurality of spaced planar contact boards, individual conductive cables interconnecting each of said boards to said replacement relay, and permitting adjustable relative spacing therebetween, said contact boards each having a planar configuration and being sufficiently thin to be readily inserted in said interstices formed between said rows of contacts to be retained thereby, said contact boards upon being so positioned serving to mate with the rows of contacts to permit retention of said contacts in opened condition and to establish electrical communication to contacts on said replacement relay, whereby said rows of contacts are in effect opened and closed by operation of said replacement relay.

3,852,646

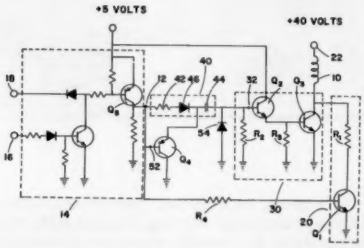
SOLENOID DRIVE CIRCUIT

Edwin E. Mason, Harrisburg, Ohio, assignor to Design Elements, Inc., Columbus, Ohio

Filed Dec. 28, 1970, Ser. No. 101,502

Int. Cl. H01h *47/18*

U.S. Cl. 317—141 S **5 Claims**



1. A solenoid drive circuit for energizing and de-energizing a solenoid in response to suitable signals at a drive circuit input, said circuit comprising:

a. a first electronic switch means in series with said solenoid and a source of driving power for switching a current through said solenoid, the first switch means having a control input connected to and being controlled at said drive circuit input;

b. an electronic valve means connected parallel to said first switch means for providing a time changing current through said solenoid, the valve means having a control input;

c. a timing means for providing a time changing current for controlling said valve means and comprising serially connected timing resistance, capacitance and a diode connected to permit current flow in a direction to turn on said valve means and to charge said capacitance, said timing means connected between the control input of the valve means and said drive circuit input; and

d. capacitance discharge means for at times discharging the capacitance and comprising a second electronic switch means connected to discharge said capacitance when turned on and a second diode connected in series with the second electronic switch means and said capacitance in a polarity to be reverse biased except during discharge of the capacitance.

3,852,647

EXPLOSION PROOF STRUCTURE FOR ELECTROLYTIC CAPACITOR

Hiroshi Ishii, Nagano-ken, Japan, assignor to Nichicon Capacitor Limited, Kyoto, Japan

Filed June 15, 1973, Ser. No. 370,210

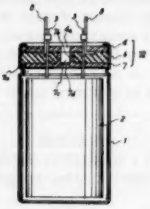
Claims priority, application Japan, June 21, 1972, 47-73457[U]

Int. Cl. H01g *9/00*

U.S. Cl. 317—230 **2 Claims**

1. An electrolytic capacitor, comprising a metal casing, a capacitor element and a terminal plate fitted in the opening of said casing, said terminal plate including a bottom plate made of thermoplastic resin and an overlying layer of relatively soft material for sealing the casing, said bottom plate being pro-

vided with a cylindrical projection having a hollow passage therein and a thin diaphragm within and closing said passage, said diaphragm and said projection being formed integrally



with said bottom plate and spaced inwardly from the bottom surface of the bottom plate a distance not greater than one-half the length of said passage.

3,852,648

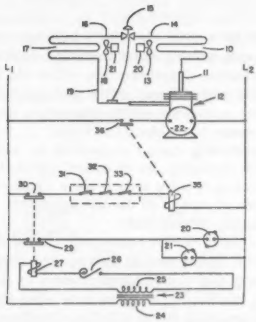
CONTROL CIRCUIT

Vincent T. Barry, and George T. Privon, both of Camillus, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 146,710, May 25, 1971, abandoned. This application Feb. 15, 1973, Ser. No. 332,858

Int. Cl. H02p *1/44;* **G05d** *23/32*

U.S. Cl. 318—221 H **7 Claims**



1. In an air conditioning system operable to supply treated air to an area including a refrigeration unit comprising a compressor, a condenser, an evaporator and expansion means connected in a closed circuit, a motor for actuating said compressor, said motor having a main winding and an auxiliary winding connected in parallel, the improvement which comprises a control circuit to regulate the operation of the compressor motor of said refrigeration unit comprising:

A. a supply circuit for providing electrical energy to said compressor motor, including thermally responsive switch means operable to energize said supply circuit in response to temperature conditions in said area;

B. a temperature responsive resistance element connected in series with said auxiliary winding of said compressor motor, the resistance of said responsive element substantially increasing as a function of its temperature, the temperature thereof being increased by the flow of current therethrough;

C. first capacitor means connected in series with said auxiliary winding and in parallel with said temperature responsive element, current to said auxiliary winding during starting conditions flowing through both said first capacitor means and said temperature responsive element in a predetermined relationship; current to said auxiliary winding passing only through said capacitor means when the resistance of said element substantially eliminates the flow of current therethrough when normal operating conditions have been obtained; and

D. heat sensitive means responsive to the temperature of said resistance element, said heat sensitive means being placed in a state so as to substantially interrupt the flow of electrical energy therethrough in response to the increase of the temperature level of said resistance element, caused by the flow of current therethrough, said heat sensitive means when in its energy interrupting state operating to prevent reenergization of said compressor motor once the supply of electrical energy thereto has been interrupted, reenergization being prevented until said heat sensitive means is placed in a state to permit the passage of energy therethrough in response to the temperature of said resistance element decreasing due to the interruption of current flow therethrough.

3,852,649

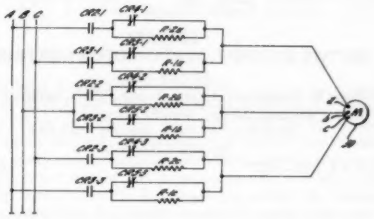
MATERIAL HANDLING APPARATUS WITH CARRIAGE DRIVE MEANS

Lee Kindgren, Rockford, and William B. Scott, Steward, both of Ill., assignors to W. A. Whitney, Corporation, Rockford, Ill.

Filed Nov. 7, 1973, Ser. No. 413,501

Int. Cl. H02p *7/40*

U.S. Cl. 318—257 **6 Claims**



1. The combination of, a power-driven, reversible conveyor adapted to support an elongated structural member for movement in an endwise direction, control means selectively operable to advance, reverse and stop said conveyor and the supported member, a carriage movable forwardly and rearwardly along said conveyor and having an element engageable with the forward end of said member, a reversible a.c. induction motor for moving said carriage, and means responsive to said control means for supplying said motor with:

a. a first voltage for causing said carriage to move reversely when said member is moved reversely, said first voltage being of sufficient magnitude to cause said carriage, in the absence of said member, to move at a rate greater than the rate of said member thereby to keep said element in engagement with said member;

b. a second voltage for causing said carriage, in the absence of the member, to move reversely when said member is stopped, said second voltage being of lower magnitude than said first voltage so as to cause said element to remain pressed against the stopped member without said motor developing excessive heat; and

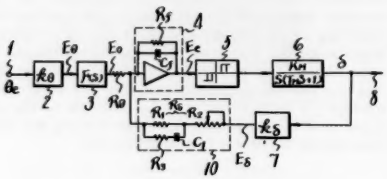
c. a third voltage for causing said carriage to tend to move forwardly when said member is moved forwardly, the magnitude of said third voltage being insufficient to advance said carriage at a rate greater than the rate of said member whereby said element is held in engagement with said member while said motor reduces the force with which said member must push said carriage to move the latter forwardly.

3,852,650

SERVO APPARATUS FOR MARINE AUTOPILOT

Isao Masuzawa, Kuki; Tsuneo Awano, and Kazutoshi Onishi, both of Yokohama, all of Japan, assignors to Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.), Tokyo, Japan

Filed May 23, 1973, Ser. No. 363,167
Claims priority, application Japan, May 27, 1972, 47-52736
Int. Cl. G05d 1/00; B63h 25/02
U.S. Cl. 318—588 4 Claims



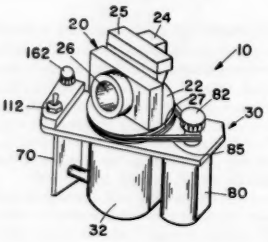
1. A servo apparatus for a marine autopilot comprising a servo loop consisting of a servo-amplifier, a relay-like operation device, a power unit, a transducer and a feedback circuit including a first resistor and a series circuit of a second resistor and a first capacitor connected in parallel to said first resistor for stabilization, and a third variable resistor connected in series with the parallel circuit of the first resistor and the series circuit whereby stabilizing effects on said servo loop by said series circuit is varied by changing the resistance value of said third variable resistor.

3,852,651

SECTOR SCANNING SERVO-MOTOR CONTROLLED APPARATUS

William R. Dufendach, Grand Rapids, Mich., assignor to Vari-Tech Company, Grand Rapids, Mich.

Filed Nov. 9, 1972, Ser. No. 305,105
Int. Cl. G05g 5/00
U.S. Cl. 318—627 10 Claims



1. A system for periodically reversing the drive direction of a reversible motor at a constant rate over a selectable range of motion by changing the drive signal applied to the motor to vary the motor speed comprising:

a reversible drive motor mounted to a fixed member;

actuation means positioned on a movable element driven by said motor, said element movable in opposite directions as the motor drive signal is changed;

detection means positioned on a fixed member to be actuated by said actuation means to develop a control signal;

monostable circuit means having a predetermined time delay and coupled to said detection means to be switched between stable and unstable states in response to said control signal therefrom;

supply means for supplying a selectable amplitude direct voltage for driving said motor at a speed selectable to determine the angle of motion through which said movable element travels during said predetermined time delay; and

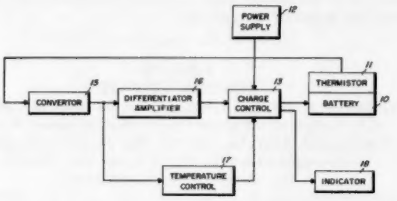
switch means coupled to said monostable circuit to be actuated by the change of state of said monostable circuit, said switch means coupling said supply means to said drive motor in a first or second manner to drive said motor in first or second directions in response to the different states of said monostable circuit.

3,852,652

RAPID BATTERY CHARGING SYSTEM AND METHOD

Leon Jasinski, Lauderhill, Fla., assignor to Motorola, Inc., Chicago, Ill.

Filed Aug. 6, 1973, Ser. No. 385,937
Int. Cl. H02j 7/06
U.S. Cl. 320—35 14 Claims



1. A system for rapidly charging a battery comprising:

a. temperature sensing means coupled to the battery for sensing changes of temperature within the battery;

b. conversion means connected to said temperature sensing means for converting the temperature sensed by said sensing means to an electrical signal;

c. a differentiating circuit connected to said conversion means for receiving the electrical signal therefrom and differentiating it once to provide a signal representative of the rate of change of the temperature;

d. power supply means; and

e. charge control means connected to said differentiating circuit and including first and second charging circuits connecting said power supply means to the battery for charging the battery at a first rate when the signal from the differentiating circuit is below a predetermined amplitude and at a second rate when the signal is above the predetermined amplitude.

3,852,653

VOLTAGE PROTECTION CIRCUIT FOR TRANSISTOR REGULATORS

Kazusuke Kuroda; Keigo Naoi, and Hitoshi Minorikawa, all of Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 3, 1969, Ser. No. 838,916
Claims priority, application Japan, July 5, 1968, 43-56656
Int. Cl. H02j 7/24
U.S. Cl. 320—64 8 Claims

1. A voltage regulator device of a generator for vehicles comprising:

an AC generator having an output winding and a field winding;

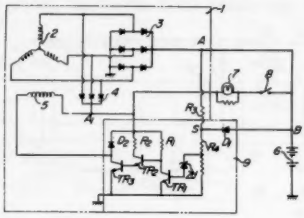
a rectifier means having a main rectifier circuit and an auxiliary rectifer circuit;

a battery connected to an output terminal of said main rectifer circuit; a zener diode and a diode;

a switching circuit means for controlling a field current flowing through said field winding in response to conduction of said zener diode, an output terminal of said

switching circuit means being connected to an output terminal of said auxiliary rectifier circuit through said field winding;

a voltage divider whose output terminal is connected to an input terminal of said switching circuit means through said Zener diode and whose input terminal is connected to said battery through said diode, one end of said diode being connected to said battery and the other end thereof being connected to said input terminal of said voltage divider; and



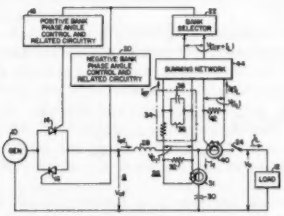
a resistor connected between said output terminal of said main rectifier circuit and said input terminal of said voltage divider.

3,852,654

CYCLOCONVERTER SYSTEM INCLUDING MEANS TO DERIVE A CONTROL SIGNAL REPRESENTING FUNDAMENTAL CONVERTER OUTPUT

Laszlo Gyugyi, and Eric J. Stacey, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 11, 1972, Ser. No. 242,988
Int. Cl. H02m *5/30*
U.S. Cl. 321—7 **3 Claims**



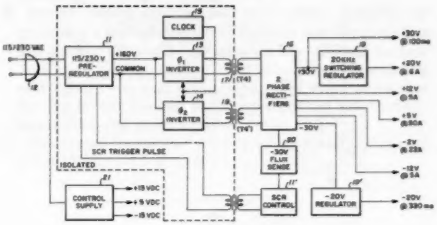
1. In a cycloconverter system having positive and negative banks of gate controlled switching rectifier elements which are gated by firing circuits to convert a first alternating waveform from a source into a second alternating waveform that characteristically includes a desired fundamental frequency component and also harmonics of the fundamental component, which harmonics are substantially removed by a filter including a capacitor and the fundamental component is applied to a load connected across the filter capacitor, the improvement comprising: apparatus to derive, for control purposes, a signal that corresponds to the referred to fundamental component of the said alternating output current wave, including any distortion resulting from load switching and load nonlinearity, so as to permit detection of zero crossing points thereof, said apparatus comprising first means to develop a current proportional to alternating current in the filter capacitor and independent of load transients, second means to develop a current proportional to alternating current in the load, and third means to add vectorially said alternating currents from said first and second means, said filter capacitor being connected in a circuit branch across the load, said first and second means to develop currents comprising current transformers respectively associated with conductors in series with the filter capacitor in the branch across the load and with the load, and further comprising an additional filter to filter the current from said first means before reaching said third means.

3,852,655

HIGH EFFICIENCY POWER SUPPLY

Gregory Justice, Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 144,618, May 18, 1971, abandoned. This application Jan. 29, 1973, Ser. No. 327,541
Int. Cl. H02m *1/14*
U.S. Cl. 321—9 **4 Claims**



1. A rectifier bridge circuit comprising:

a bridge having four arms, two input terminals for being coupled to an incoming AC supply line having a line frequency, and two output terminals, each of two of said arms containing a controlled switching element and each of the other two of said arms containing a diode, said bridge being operable for producing across the output terminals a recurring output waveform having a DC component, having fluctuating components, and having a repetition frequency of twice the line frequency;

circuit means coupled across the output terminals for converting the fluctuating components of the recurring output waveform to an alternating current having a frequency at a harmonic of the repetition frequency of the recurring output waveform and for creating a ripple voltage component at said harmonic;

a filter; and

means for inductively coupling said circuit means to said filter to supply said DC component and said ripple voltage component thereto.

3,852,656

INVERTER FAULT PROTECTION AND FREQUENCY LIMITING CIRCUIT

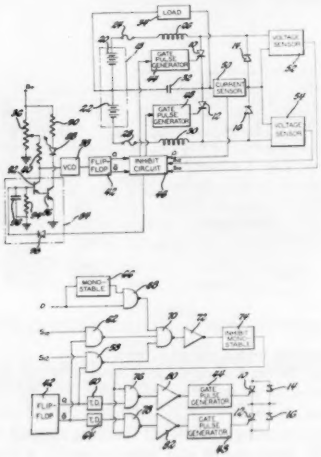
Frank J. Bourbeau, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 19, 1974, Ser. No. 462,363
Int. Cl. H02m *1/08*
U.S. Cl. 321—11 **3 Claims**

1. A fault protection circuit for an inverter, the inverter including first and second series coupled controlled rectifiers each having a respective oppositely poled diode coupled in parallel therewith and including at least one resonant circuit for commutating each of the controlled rectifiers by driving current through the diode parallel coupled therewith, the fault protection circuit comprising: means for generating alternating timing logic signals Q and Q, the timing logic signal Q

representing the time period during which the first controlled rectifier may conduct and the timing logic signal Q representing the time period during which the second controlled rectifier may conduct; means for sensing current through the diodes and generating a current logic signal D coexistent with sensed current; first voltage sensing means coupled to the first controlled rectifier for generating a voltage logic signal S_1 when the first controlled rectifier is forward blocking; second voltage sensing means coupled to the second controlled rectifier for generating a voltage logic signal S_2 when the second controlled rectifier is forward blocking; means responsive to the timing logic signals Q and $\overline{Q}$, the current logic signal D and the voltage logic signals S_1 and S_2 for generating an inhibit logic signal I defined by the equation

$$I = D + QS_1 + \overline{Q}S_2; \quad (1)$$



and gating means responsive to the inhibit logic signal I and the timing signals Q and $\overline{Q}$ for gating the first controlled rectifier conductive upon the occurrence of a condition defined by the expression

$$Q\,\overline{I} \quad (2)$$

and gating the second controlled rectifier conductive upon the occurrence of a condition defined by the expression

$$\overline{Q}\,\overline{I}, \quad (3)$$

whereby the inhibit logic signal I is generated to prevent a short circuit fault across the first and second controlled rectifiers.

3,852,657

COMMUTATION CONTROL FOR INVERTER CIRCUIT

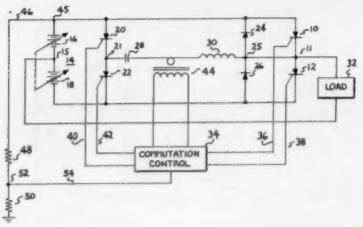
Einar A. Skogsholm, and John G. Tracy, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Nov. 19, 1973, Ser. No. 417,239
Int. Cl. H02m *7/52, 1/18*
U.S. Cl. 321—18 **19 Claims**

1. In an inverter circuit of the type including at least one pair of controlled rectifiers for supplying electrical power to a load from a direct current power source and means for storing an electrical charge which is controllably utilized to provide a commutation current to render a then conducting controlled rectifier nonconductive, means for controlling the time for rendering said controlled rectifiers conductive comprising:

a. means for sensing the commutation current during the commutation of either one of the controlled rectifiers and to provide a first signal indicative thereof;

b. means to provide a second signal indicative of a variable circuit parameter; and,



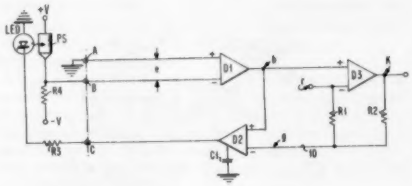
c. means responsive to said first and second signals to initiate conduction of the other of said controlled rectifiers when said first and second signals are of a prescribed relationship.

3,852,658

BISTABLE, SELF-COMPENSATING TRANSDUCER CIRCUIT

Roland J. Braun, and Frederick Buckley, both of Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,544
Int. Cl. G05d *27/02*
U.S. Cl. 323—16 **7 Claims**



1. A transducer circuit dc coupled to a signal source for sensing signal transitions superimposed on an undetermined or changing bias which may be larger than the signal amplitude which comprises:

an input differential amplifier having its input connected directly to said signal source;

a switching differential amplifier having a first input connected to the output of said input amplifier;

a source of reference voltage connected to a second input of said switching amplifier;

a control signal differential amplifier having a first input connected to the output of said input amplifier;

means connecting a second input of said control signal amplifier to the output of said switching amplifier;

means connecting said second input of the control signal amplifier to said reference voltage source;

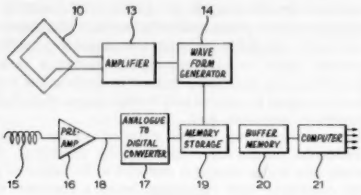
feedback connecting means from the output of said control signal amplifier to said signal source; and

means associated with said control signal amplifier for filtering out high speed signal transitions.

3,852,659
GEOPHYSICAL PROSPECTING METHOD AND APPARATUS UTILIZING CORRELATION OF RECEIVED WAVEFORMS WITH STORED REFERENCE WAVEFORMS

Anthony Rene Barringer, Willowdale, Ontario, Canada, assignor to Barringer Research Limited, Ontario, Canada

Filed Apr. 9, 1973, Ser. No. 349,629
Claims priority, application Great Britain, Apr. 11, 1972, 16546/72
Int. Cl. G01v *3/10, 3/12, 3/16*
U.S. Cl. 324—6 **1 Claim**



1. Geophysical prospecting apparatus comprising:

a. means for generating a primary electromagnetic field and coupling said primary field with an area of the earth, said primary field being defined by a pre-determined, periodic, time varying waveform containing a plurality of frequency components sufficient to permit the identification of mineral deposits which may be located in said area, said primary field causing eddy currents to be induced in conductive deposits present in said area which are intersected by said primary field, which eddy currents result in the formation of secondary electromagnetic fields,

b. means for receiving electromagnetic signals emanating from the earth which are responsive in phase and amplitude to said secondary electromagnetic fields, said electromagnetic signals being received in the presence of said primary field and during intervals when said primary field is not time varying,

c. means for storing a plurality of reference waveforms which respectively are related in a pre-determined manner to a plurality of different pre-determined geophysical conditions, said reference waveforms comprising mathematically derived functions representing geophysical conductors of a plurality of time constants and being selected from the group consisting of (a) a conductive loop, (b) a conductive sheet and (c) a conductive sphere, and

d. means for correlating said received electromagnetic signals with said stored reference waveforms and for indicating the particular reference waveform which provides an optimum match therewith.

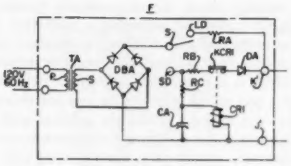
3,852,660
CIRCUIT BREAKER FAULT SIMULATOR

Alfred E. Maier, Beaver Falls, and Alan B. Shimp, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 28, 1973, Ser. No. 401,932
Int. Cl. G01r *31/02*
U.S. Cl. 324—28 R **16 Claims**

1. A fault simulator for a trip circuit of a circuit interrupter, where said trip circuit is electrically connected to a sensor and where said sensor monitors the electrical current flowing in an electrical conductor protected by said circuit interrupter to thereby provide a signal to said trip circuit to thereby cause said trip circuit to actuate said circuit interrupter to act to protect said conductor from the effects of said current when said current attains a predetermined value and after a predetermined period of time which time is related to the amount of electrical current monitored by said sensors, comprising:

A. first means additional to said sensor actuable for providing a first simulating signal to said trip circuit at any desired time and regardless of the value of current flowing in said conductor, said latter signal simulating said signal from said sensor when said value of current flowing



in said conductor is substantially larger than said predetermined value;

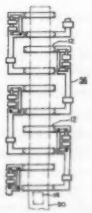
B. second means additional to said sensor actuable for providing a second simulating signal to said trip circuit at any desired time and regardless of the value of current flowing in said conductor, said latter signal simulating said signal from said sensor when said value of current flowing in said conductor is larger but not substantially larger than said predetermined value; and

C. third means for interconnecting said first and said second means with said trip circuit.

3,852,661
A POSITION INDICATOR EMPLOYING MAGNETIC CIRCUITS TO MONITOR THE POSITION OF A MAGNETICALLY PERMEABLE MEMBER MOVABLE ALONG AN AXIS HAVING ONE DEGREE OF FREEDOM

Andras I. Szabo, Export, and Dan V. Tarli, Wilmerding, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 110,058, Jan. 27, 1971, abandoned. This application Sept. 25, 1972, Ser. No. 292,245
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 PS **14 Claims**



1. A control rod mechanism for a nuclear reactor comprising:

an elongated tubular housing;

an elongated control drive rod positioned for longitudinal movement within said housing, said drive rod being constructed from a magnetized magnetically hard material forming a flux source;

a plurality of magnetically soft generally C-shaped cores each having a first and second magnetic loop and a magnetic flux path common to at least a portion of said first and second magnetic loops, said first magnetic loop forming a closed magnetic flux path and said second magnetic

loop forming a normally open circuited magnetic flux path with two poles associated therewith, said magnetic cores positioned longitudinally along said housing;

an annular ring of magnetically soft material affixed to each of the poles of said magnetic cores respectively, said annular rings closely receiving said housing within the center thereof;

a saturable transformer having a primary and secondary winding forming at least a portion of each of said first magnetic loops;

magnetic biasing means for magnetically biasing each of said magnet cores and providing a sufficient source of flux to saturate said transformer, said biasing means producing a flux field within said magnetic cores, respectively, which is in opposition to the flux field induced by said drive rod at the point in movement thereof where said drive rod appears across the poles of said magnetic cores, said drive rod having a sufficient source of flux to unsaturate said transformer when closing said normally open circuited magnetic core flux path;

AC excitation means for exciting said primary transformer windings; and

indication means for indicating a change in current across said transformer secondary windings.

3,852,662

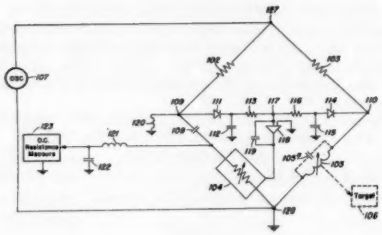
PROXIMITY MEASURING EMPLOYING A SELF-BALANCING BRIDGE AND MEASURING THE ADJUSTABLE BALANCING COMPONENT THEREOF

Bernard R. Katz, 33 Philip Pl., Irvington, N.J. 07111

Continuation of Ser. No. 126,238, March 19, 1971, abandoned. This application Aug. 2, 1973, Ser. No. 385,180

Int. Cl. G01r *33/00*

U.S. Cl. 324—34 PS **11 Claims**



1. In apparatus for determining the interstice between a target means and variable inductance sensing means including bridge means having a network branch including said variable inductance sensing means; means for applying an energizing signal to said bridge means; control signal generating means coupled to said bridge means for generating a control signal proportional to the deviation by said bridge means from a balanced potential condition; and target means magnetically coupled to said variable inductance sensing means and adapted to vary the impedance thereof in accordance with said interstice, thereby altering a balanced potential condition of said bridge means, the improvement comprising:

first peak detection means included in said control signal generating means comprised of positive half wave rectifying means having an input terminal connected to a first output terminal of said bridge means and an output terminal coupled to the input of a first low pass filter means;

second peak detection means included in said control signal generating means comprised of negative half wave rectifying means having an input terminal connected to a second output terminal of said bridge means and an output terminal coupled to the input of a second low pass filter means;

comparator means coupled to the outputs of said first and second low pass filter means for generating a signal proportional to the difference in magnitude between signals appearing at said outputs;

integrator means coupled to said comparator means for producing a slowly varying control signal;

adjustable resistance means included in another network branch of said bridge means, said adjustable resistance means comprising photoresistive cell means optically coupled to light emitting diode means, said diode means coupled to said integrator means and said photoresistive cell means having a resistance that is dependent upon the intensity of light received thereby such that said light emitting diode means emits light having an intensity determined by the magnitude of said control signal;

conductor means connected between said integrator means and said adjustable resistance means for applying said control signal to said adjustable resistance means for modifying the resistance thereof in accordance with said control signal to restore said bridge means to its balanced potential condition; and

resistance measuring means coupled to said adjustable resistance means for measuring the resistance thereof when said bridge means is restored to its balanced potential condition, said resistance being a function of said interstice.

3,852,663

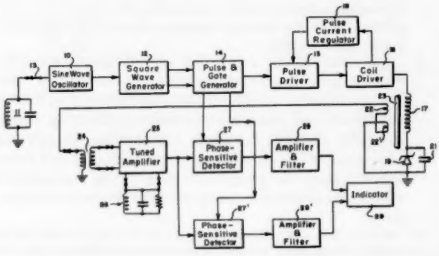
PULSE EDDY CURRENT TESTING APPARATUS USING PULSES HAVING A 50% DUTY CYCLE AND PRECISE QUADRATURE GATES

Robert A. Brooks, Rye, and Paul J. Bebick, Bronx, both of N.Y., assignors to Magnetic Analysis Corporation, Mt. Vernon, N.Y.

Continuation-in-part of Ser. No. 332,874, Feb. 15, 1974, Pat. No. 3,798,539. This application Feb. 11, 1974, Ser. No. 441,148

Int. Cl. G01r *33/12*

U.S. Cl. 324—40 **4 Claims**



1. Pulse eddy current testing apparatus which comprises

a. a sine wave oscillator,

b. a square wave generator supplied with the sine wave from said oscillator for producing a square wave therefrom,

c. pulse generator means for producing from said square wave substantially 50 percent duty cycle pulses having leading and trailing edges substantially coinciding with alternate edges of the square wave and 25 percent duty cycle pulses having leading and trailing edges coinciding with successive edges of the square wave,

d. said 50 percent and 25 percent duty cycle pulses each having a PRF one-half the frequency of said square wave,

e. gate generating means for producing from predetermined edges of said pulses one series of gating pulses coinciding with the leading or trailing edges of said 50 percent duty cycle pulses and a second series of gating pulses coinciding with edges of said 25 percent duty cycle

pulses lying halfway between the edges of the 50 percent duty cycle pulses or halfway between successive 50 percent duty cycle pulses,

f. test coil means supplied with said 50 percent duty cycle pulses for inducing eddy currents in an object under test and producing output signals varying with defects or flaws in the object,

g. an amplifier supplied with said output signals and tuned to substantially the PRF of said 50 percent duty cycle pulses,

h. a pair of phase-sensitive detectors supplied with respective series of said gating pulses and with the output of said tuned amplifier for producing quadrature signal components thereof,

i. and means for utilizing the signal components from said phase-sensitive detectors to produce indications of said defects or flaws in the object under test.

3,852,664

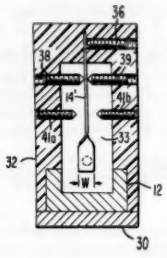
MAGNETIC REED SENSOR SUITABLE FOR USE IN IGNITION TIMING SYSTEMS

Leonard Robin Hulls, Marblehead, Mass., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 346,670, March 30, 1973, Pat. No. 3,813,596. This application Sept. 19, 1973, Ser. No. 398,876

Int. Cl. G01r *33/00*; **H01h** *36/00*

U.S. Cl. 324—41 **7 Claims**



1. A magnetic reed sensor comprising, in combination:

a housing of non-magnetic material;

a permanent magnet mounted at one end of said housing, said magnet having first and second end poles defining a gap of given distance therebetween and establishing a magnetic flux path thereacross;

a reed of flexible magnetic material fixedly mounted at one of its ends to the other end of said housing, said reed having a portion of its other end disposed centrally in said gap between said end poles in said magnetic flux path, so that said reed is normally maintained in a central position of stable equilibrium in said gap;

a magnetic member adapted to be mounted external of said housing and to be movable in a path passing in close proximity to said magnetic flux path, to disturb the magnetic flux path established across said poles only when said member is in close proximity to said housing, thereby to cause said flexible reed to be deflected away from the path of said moving member and toward the more distant one of said end poles; and

means for determining the position of said reed relative to said end poles.

3,852,665

APPARATUS FOR TESTING POTENTIOMETERS

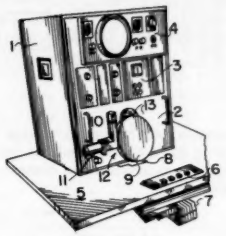
Manfred Wolfgang Bothner, Geretsried, Germany, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Feb. 12, 1973, Ser. No. 332,008

Claims priority, application Germany, Feb. 17, 1972, 2207525

Int. Cl. G01r *27/02*

U.S. Cl. 324—63 **17 Claims**



1. An apparatus for testing potentiometers having a resistor element with two end terminals and a slider contact which traverses said resistor in response to rotation of a spindle, comprising a carrier having a plurality of potentiometer supports at spaced points thereon, and a plurality of devices positioned at stations adjacent to said carrier, said carrier being movable to locate each support successively at said stations in a predetermined sequence, wherein the improvement comprises

an adjusting device at one of said stations including

rotary driving means engageable with the spindle of a potentiometer in a support on said carrier adjacent to said one station,

means applying a constant potential to the end terminals of said potentiometer,

means sensing the potential appearing between the slider contact and one end terminal, and

means disengaging said driving means from said spindle when the ratio between the potential across the end terminals of said potentiometer to the potential between the slider contact and said one end terminal has a predetermined value, and

an evaluation device at a subsequent one of said stations, including

second rotary driving means engageable with the spindle of a potentiometer in a support on said carrier adjacent to said subsequent station,

means passing a constant current from one end terminal of said potentiometer through the slider contact thereof, and

means visibly displaying the magnitude of the potential between said last mentioned slider contact and the other end terminal.

3,852,666

METHOD AND APPARATUS FOR COMPENSATION OF THE TEMPERATURE-DEPENDENCY OF THE CONDUCTIVITY OF A FLUID WITH SUSPENDED PARTICLES

Hermann Gahwiler, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed May 21, 1973, Ser. No. 362,011

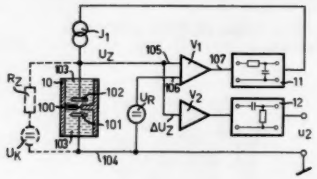
Claims priority, application Switzerland, June 30, 1972, 009830/72

Int. Cl. G01n *27/00, 27/42*

U.S. Cl. 324—71 CP **6 Claims**

2. An apparatus for compensating the temperature-dependency of the conductivity of an electrically conductive

liquid during pulse amplitude measurement of particles suspended in the liquid by means of a conductivity cell comprising means for compensating the temperature-dependency of the electrically conductive liquid, said compensating means



embodying a constant direct-current voltage source and at least one frequency filter, the conductivity cell being electrically coupled with the constant direct-current voltage source and said frequency filter.

3,852,667

PROBE FOR ELECTROSTATIC VOLTMETER

Bruce T. Williams, Lockport, and Clarence R. Hare, Barker, both of N.Y., assignors to Trek Inc., Gasport, N.Y.

Filed May 10, 1973, Ser. No. 359,004
Int. Cl. G01r *31/02*
U.S. Cl. 324—72 **15 Claims**

1. A sensor for an electrostatic voltmeter comprising:

a. a housing including an operative surface having an opening therein;

b. a voltage sensitive electrode having an operative surface disposed toward said opening; and

c. vibrator means in said housing to vibrate said electrode in a direction generally transversely of said opening to vary the amount of said electrode operative surface which is exposed through said opening to an external electrical field or potential being measured, said vibrator means comprising a generally elongated element having a resonant mechanical vibration characteristic, electromechanical driver means adapted to be converted to an electrical signal source and operatively connected to said element adjacent one end thereof and means to connect said electrode to said element adjacent the other end thereof;

d. whereby the capacitive coupling between said electrode operative surface and the external field or potential being measured is varied as a function of the rate of vibration of said electrode whereby an alternating voltage is induced on said electrode having an amplitude proportional to the amplitude of the external electrical field or potential being measured.

3,852,668

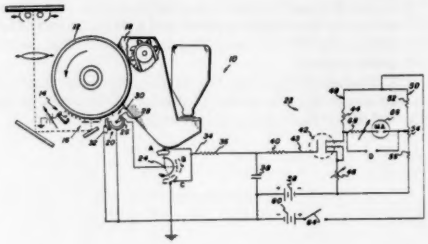
ELECTROMETER SYSTEM

James M. Hardenbrook, Columbus, and Paul G. Andrus, Powell, both of Ohio, assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 14, 1973, Ser. No. 388,505
Int. Cl. G01r *31/02*
U.S. Cl. 324—72 **13 Claims**

1. In an electrometer system for non-contact detection of the electrostatic charge on an electrostatographic surface including an electrometer probe containing a probe electrode and an electrometer circuit providing an output signal corresponding to a charge induced on said probe electrode from said surface, wherein said electrometer circuit is mounted in a chassis unit, the improvement wherein:

said electrometer probe comprises first and second concentric elongated small diameter conductive hollow tubes relatively movable with respect to one another and electrically shielding said probe electrode,



said tubes extending from said chassis unit to define an elongated small diameter probe,

said probe electrode extending through said tubes,

said first tube containing a relatively small probe window substantially spaced from said chassis in a side of said tube for exposing said probe electrode, and

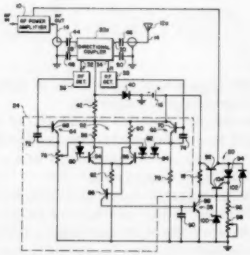
said second tube containing a probe shutter area for covering said probe window in said first tube by said relative movement between said first and second tubes.

3,852,669

CIRCUIT TO PROTECT RF OUTPUT AMPLIFIER AGAINST MISMATCH DAMAGE

Dennis W. Bowman, Eatontown, and Robert E. Horn, Middletown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 26, 1973, Ser. No. 373,830
Int. Cl. H03g *3/18*
U.S. Cl. 325—151 **6 Claims**



1. In combination with an output rf power amplifier and a dc power source for the rf power amplifier, a load for the rf power amplifier and rf power delivering means coupling the rf power amplifier to the load,

a resistor and a normally off electronic switch connected in series across the dc power source,

regulator means including a zener diode connected across said electronic switch and short-circuited by said elec-

tronic switch when the latter is turned on, for delivering power from the dc power source to the rf power amplifier at one level when the electronic switch is off and at a lower level when the electronic switch is on,

means for sampling selected parameters in the rf power delivering means that are representative of magnitude of forward power and reflected power, respectively,

power cutback means including a pair of essentially equal gain emitter followers, one of said emitter followers having a potentiometer output, means for coupling the selected parameter representative of forward power to the input of the emitter follower with the potentiometer output and means for coupling the selected parameter representative of reflected power to the input of the other emitter follower,

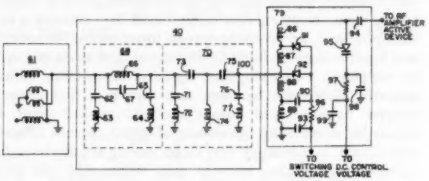
means coupled to the outputs of both emitter followers to turn on said electronic switch only when and for so long as the selected parameters representative of reflected power and forward power, respectively, exceed a predetermined ratio for instantaneously reducing the dc power to said rf power amplifier to substantially reduce the level of forward rf power while continuing operation of said power cutback means.

3,852,670

TUNER WITH INTEGRAL INPUT FILTER

John Ma, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 29, 1973, Ser. No. 410,937
Int. Cl. H04b *1/18*
U.S. Cl. 325—357 **6 Claims**



1. A television tuner for converting the frequency of a received signal to an intermediate frequency, said tuner comprising:

a shielded housing;

an RF amplifier, a mixer and a local oscillator stage in said shielded housing each including tuned circuit components having variable reactance, for adjusting the resonant frequencies of said stages;

an input filter network in said shielded housing, coupling the received signal to said RF amplifier, and reducing the levels of signal frequencies within a predetermined band of frequencies; and

means, including an RF amplifier input network, permitting alignment of said input filter network while coupled to said RF amplifier stage by altering the impedance of said RF amplifier input network to terminate said filter network, for signals within said band of frequencies, in an impedance suitable for alignment of said filter.

3,852,671

COMMUNICATION RECEIVING APPARATUS EMPLOYING SEVERAL SAMPLES OF BASEBOARD NOISE TO DETECT AN INCOMING SIGNAL AND TURN ON THE APPARATUS

Curtis A. Risley, Sharon, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 25, 1973, Ser. No. 373,412
Int. Cl. H04b *1/06*
U.S. Cl. 325—492 **10 Claims**

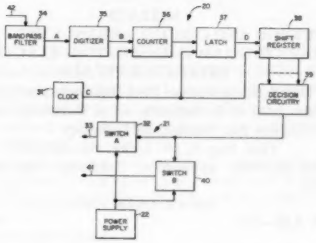
8. Apparatus responsive to pulses of electromagnetic energy comprising

filter means adapted to receive electromagnetic energy and operable to pass electromagnetic energy of predetermined frequencies;

digitizing means coupled to said filter means for generating a pulse in response to each pulse of electromagnetic energy of the predetermined frequencies and of predetermined amplitude;

counting means coupled to said digitizing means and operable to count pulses from the digitizing means for a predetermined period of time;

latch means coupled to said counting means and operable to produce a first indication when the counting means counts less than a predetermined number of pulses within said predetermined period of time and a second indication when the counting means counts said predetermined number of pulses within said predetermined period of time;



storage means coupled to said latch means for storing a plurality of indications from said latch means; and

decision means coupled to said storage means and having first and second output conditions, said decision means being operable to change from the second output condition to the first output condition in response to a first predetermined combination of first and second indications being stored in said storage means and being operable to change from the first output condition to the second output condition in response to a second predetermined combination of first and second indications being stored in said storage means;

said storage means including a shift register having an input connection connected to the latch means and a plurality of stages arranged in series, each stage having a first state and a second state and an output connection, and being in the first state to store a first indication and the second state to store a second indication; and

said decision means being connected to the output connections from the stages of the shift register.

3,852,672

FOUR-QUADRANT MULTIPLIER-NOTCH FILTER DEMODULATOR

Everett J. Nelson, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 29, 1973, Ser. No. 410,433
Int. Cl. G01b *7/16*
U.S. Cl. 328—1 **5 Claims**

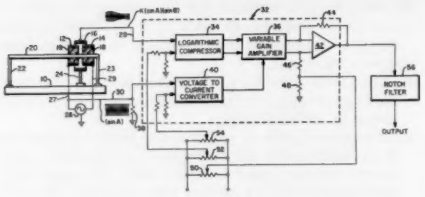
1. A carrier-suppressed amplifier demodulator comprising:

means for generating a carrier signal of fixed frequency,

means for generating an oscillatory modulating signal,

means for modulating said carrier signal with said modulating signal to produce a modulated signal,

means for multiplying said modulated signal with said carrier signal to produce an output multiplied signal, and



means for passing said multiplied signal through a notch filter to produce an output signal proportional to the modulating signal.

3,852,673

METHOD AND CIRCUIT ARRANGEMENT FOR PRODUCING AND TRANSMITTING ELECTRICAL REFERENCE PULSES

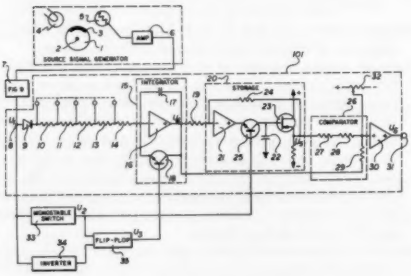
Volker Guyot, Klein-Gerau; Paul Holdinghausen, and Martin Mueller, both of Bickenbach, all of Germany, assignors to Carl Schenck AG, Darmstadt, Germany

Filed May 5, 1972, Ser. No. 250,727

Claims priority, application Germany, May 10, 1971, 2122967

Int. Cl. G01m *1/02*

U.S. Cl. 328—127 **12 Claims**



1. A circuit arrangement for producing electrical reference pulse signals having timed relationships to the pulses of a sequence of pulses and transmitting such signals to an output terminal, comprising a pulse source signal generator, signal integrating means having an input and an output, first circuit means operatively arranged for supplying source signals produced by said source signal generator to the input of said signal integrating means, signal amplitude storage means, second circuit means for connecting said signal storage means to the output of said signal integrating means, comparator means, third circuit means for connecting said comparator means to said signal storage means and to said signal integrating means, said comparator being further connected to said output terminal, timing means having an input connected to said source signal generator, said timing means further having output means connected to said signal integrating means and to said signal storage means, whereby a signal value at the output of said integrator means is transferred to said signal storage means in response to an end of a given pulse signal signified by said timing means, whereupon the content of said signal integrating means is erased also in response to said timing means, and wherein a predetermined amplitude portion of a signal stored in said signal storage means is compared in said comparator means with a signal appearing at the output of said signal integrating means as a result of the next pulse signal following said given pulse signal, whereby said electrical reference pulse signals are transmitted to said output terminal in response to the center of the pulse source signals produced by said source signal generator.

3,852,674

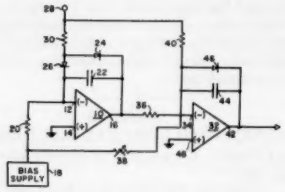
PARABOLA AND SAWTOOTH GENERATOR

Frederik J. Van Roessel, Upper Saddle River, N.J., assignor to Philips Broadcasting Equipment Corporation, Montvale, N.J.

Filed Aug. 24, 1973, Ser. No. 391,077

Int. Cl. G06g *7/18*

U.S. Cl. 328—127 **11 Claims**



1. A circuit for integrating an input voltage in accordance with a keying signal, said circuit comprising a first amplifier having a non-inverting first input means for receiving a reference potential, an inverting second input means for receiving said input voltage and said keying signal, and an output means for supplying a first amplifier signal in accordance with the potential difference between said inputs; a first capacitor coupled between said output and said second input; first means for eliminating the effects of direct current offsets on said circuit comprising a first diode having an anode-cathode voltage drop coupled between said output and said second input; and means for compensating for said voltage drop comprising a second diode series coupled between said first diode and said second input.

3,852,675

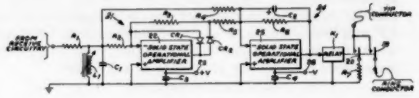
TONE DETECTION AND SWITCHING CIRCUIT

Edward F. Stewart, Raleigh, N.C., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Division of Ser. No. 296,728, Oct. 11, 1972, Pat. No. 3,790,723. This application Aug. 13, 1973, Ser. No. 387,889

Int. Cl. H03k *9/06*

U.S. Cl. 328—138 **2 Claims**



1. A tone detector comprising:

an input for a tone having a given frequency;

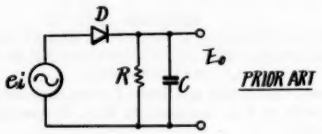
a tuned circuit coupled to said input, said tuned circuit being tuned to said given frequency;

a precision halfwave rectifier circuit coupled to said tuned circuit; and

an output circuit coupled to the output of said rectifier circuit and to said tuned circuit to produce a full wave rectified output signal with voltage gain upon detection of said tone;

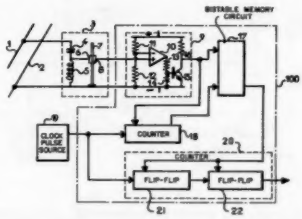
said tuned circuit including
ground potential,
a first resistor having one terminal connected to said input, and
a parallel coupled inductor-capacitor tuned circuit coupled between the other terminal of said first resistor and said ground potential; and
said rectifier including
a first solid state operational amplifier having an inverting input, a non-inverting input and an output, said non-inverting input being directly connected to said ground potential,
a second resistor coupled between the junction of said first resistor and said parallel tuned circuit and said inverting input of said first amplifier,
a first solid state diode being poled in a given direction connected between said output and said inverting input of said first amplifier, and
a series circuit coupled between said output and said inverting input of said first amplifier in parallel with said first diode,
said series circuit having
a second solid state diode poled in a direction opposite to said given direction, and
a third resistor.

3,852,676
DETECTOR CIRCUIT
Masayuki Hongu, Tokyo, and Isamu Ikeda, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Apr. 26, 1973, Ser. No. 354,681
Claims priority, application Japan, Apr. 28, 1972, 47-43072
Int. Cl. H03d *1/18*
U.S. Cl. 329—103 **11 Claims**



1. A detector circuit comprising:
A. a power source having first and second voltage terminals,
B. signal current input means comprising first and second constant current circuits connected in series between the first and second voltage terminals, the first constant current circuit supplying a direct current I_1, means for superposing an input signal current $\pm\Delta i$ on the current I_1, the second current source supplying a direct current I_2, the direction of the currents I_1 and I_2 being the same with respect to the first and second voltage terminals, and the value of the currents I_1 and I_2 being substantially the same; and
C. detector means comprised of a series circuit connected between said first and second voltage terminals, said series circuit including a transistor having input and output terminals for providing a detected signal at the output terminal in response to the input signal current $\pm\Delta i$ supplied to the input terminal, a load impedance connected to said output terminal and a diode connected to said input terminal and poled to conduct current when said transistor is conductive said input terminal being further connected to a connection point between the first and second constant current circuits, and said transistor being biased to a predetermined state of conductivity such that the transistor bias is varied as a function of said input signal current supplied to said input terminal.

3,852,677
DEMODULATOR
Claude Neuville, Paris, France, assignor to Compteurs Schlumberger, Montrouge, France
Filed June 28, 1973, Ser. No. 374,451
Claims priority, application France, June 30, 1972, 72.23729
Int. Cl. H03k *9/02*
U.S. Cl. 329—109 **4 Claims**



1. A demodulator for producing a delayed output signal in response to an input signal of the type including a pulse which has been modulated at a predetermined frequency and consisting of a limited train of pulse signals at the predetermined frequency comprising
bistable circuit means for receiving the input signal and for changing from a first state to a second state in response to the beginning of the first pulse of the train of pulse signals;
a source of clock pulses;
first counter means for receiving and counting clock pulses from said source and for producing a reset output signal when the count accumulated thereby reaches a predetermined total;
first circuit means for coupling said reset output signal from said first counter means to said bistable circuit means to return said bistable circuit means to said first state;
second circuit means for coupling the train of pulse signals in said input signal to said first counter means to reset said first counter means and restart the counting of clock pulses in response to each pulse received thereby;
second counter means for receiving and counting clock pulses from said source and for producing the delayed output signal representative of the arrival of an input signal,
said second counter means being operative to initiate said output pulse after a preselected number of clock pulses has been counted by said second counter means; and
third circuit means connected between said bistable circuit means and said second counter means for providing to said second counter means a reset signal when said bistable circuit means returns to said first state.

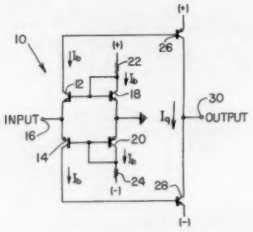
3,852,678
PUSH-PULL AMPLIFIER WITH CURRENT MIRRORS FOR DETERMINING THE QUIESCENT OPERATING POINT
George Joseph Frye, 12175 S.W. Douglas, Portland, Oreg. 97225
Filed May 7, 1973, Ser. No. 358,152
Int. Cl. H03f *3/26*
U.S. Cl. 330—15 **10 Claims**

1. A push-pull amplifier circuit comprising:
input signal means having input terminal means connected thereto for supplying input current signals to said input signal means, said input signal means including means for performing impedance transformation of said input current signals such that the input terminal means appears loaded by a low impedance, said transformation extending to zero frequency or DC;

bias means coupled to said input signal means for generating a quiescent current;

output means provided by said input signal means for supplying said input current signals in a non-inverted condition from a high impedance source of said input signal means, said high impedance source being derived from said impedance transformation means;

output signal inverting means connected to said output means of said input signal means for receiving output



signals from said input signal means, said output signal inverting means providing signal gain for amplifying said input current signals to provide amplified output current signals and also receiving said quiescent current from said input signal means for determining the quiescent operating point of said output signal means; and

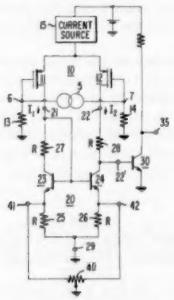
output terminal means connected to said output signal inverting means for receiving said amplified output current signals therefrom.

3,852,679

CURRENT MIRROR AMPLIFIERS

Otto Heinrich Schade, Jr., N. Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 26, 1972, Ser. No. 318,646
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D **12 Claims**



1. A differential amplifier comprising:

first and second input terminals for application of first and second input currents, respectively, with quiescent components being proportionally related in a ratio of *m* to *l*, *m* being a positive number;

a common terminal;

an output terminal;

first and second and third transistors of the same conductivity type, having respective base and emitter and collector electrodes, the transconductance versus base-emitter potential characteristics of said first and said second transistors being proportionally related in a ratio of *m* to *l*;

first and second and third direct coupling means having substantially identical potential translation characteristics, said first direct coupling means being the sole means for direct coupling said first input terminal to said first transistor base electrode, said second direct coupling means being the sole means for direct coupling said first input terminal to said second transistor base electrode;

means direct current conductively coupling said first transistor collector electrode to said first input terminal;

first and second and third resistive elements having respective resistances proportionally related to each other in a ratio of *l* to *m* to *m*, said first resistive element connecting said first transistor emitter electrode to said common terminal for conducting the entire emitter current of said first transistor, said second resistive element connecting said second transistor emitter electrode to said common terminal for conducting the entire emitter current of said second transistor, said third resistive element being connected at a first of its ends to said second input terminal and being connected at a second of its ends to said second transistor collector electrode such that the entire collector current of said second transistor flows through said third resistive element; and

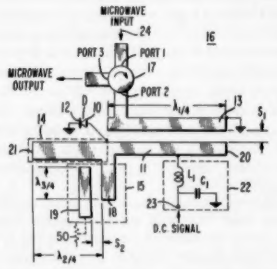
means for connecting said third transistor as a common-emitter amplifier including a direct connection of its emitter electrode to said common terminal, a connection of its collector electrode to said output terminal and direct coupling of the second end of said third resistive element to said third transistor base electrode by said third direct coupling means, said differential amplifier being operative under the aforeclaimed input current conditions to maintain substantially equal quiescent potentials at its said first and said second input terminals.

3,852,680

AMPLIFIER USING A NEGATIVE RESISTANCE SEMICONDUCTIVE DEVICE OPERATIVE IN THE ANOMALOUS MODE

Arye Rosen, Cherry Hill, and James Francis Reynolds, Hightstown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 19, 1973, Ser. No. 342,373
Int. Cl. H03f 3/10
U.S. Cl. 330—34 **5 Claims**



1. An amplifier comprising a first transmission line having a center conductor capacitively coupled to the center conductor of a second transmission line having a first electrode of a negative resistance semiconductive device connected to one end of said second transmission line center conductor and a second electrode of said device connected to ground potential, said semiconductive device generating signals at harmonically related frequencies and amplifying an input microwave

signal in response to a reverse bias signal exceeding the predetermined breakdown voltage of said device, the improvement comprising:

means for applying to said device a D.C. reverse bias signal having a magnitude less than said breakdown voltage;

means for coupling to said device, said input microwave signal having a predetermined magnitude, said input microwave signal magnitude and said D.C. reverse bias signal magnitude in combination exceeding said reverse breakdown voltage magnitude;

means for terminating said device generated signals at a first bandwidth determining harmonic frequency in a first complex impedance having real and reactive components determining amplifier operating bandwidth;

means for terminating said device generated signals at a second bandwidth determining harmonic frequency in a second complex impedance having real and reactive components for determining amplifier operating bandwith; and

means for coupling said amplified input microwave signal from said semiconductive device.

3,852,681

VARIABLE FREQUENCY OSCILLATOR SYSTEMS

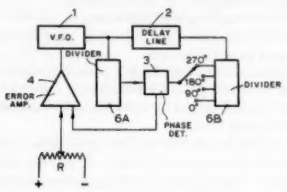
Michael James Underhill, Salfords, near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 28, 1972, Ser. No. 293,122

Claims priority, application Great Britain, Oct. 1, 1971, 45815/71

Int. Cl. H03b *3/04*

U.S. Cl. 331—1 R **6 Claims**



1. A circuit comprising a variable frequency oscillator having a frequency control input and an output; a phase detector having a first input means for receiving a signal in accordance with said oscillator output, a second input, and an output coupled to said frequency control input; a series circuit having an input coupled to said oscillator output and an output coupled to said detector second input, said series circuit comprising a frequency converter having a plurality of output means for providing output signals of different phases, switching means coupled to said converter outputs for selecting one of said output signals and a means for delaying signals coupled to said converter.

3,852,682

OSCILLATION GENERATORS

Christopher Dawe, St. Albans, and John David Middleton, Welwyn, both of England, assignors to Marconi Instruments Limited, Chelmsford, Essex, England

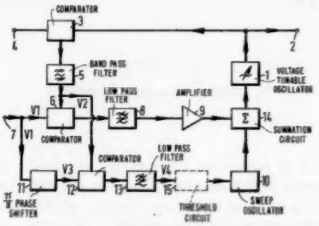
Filed June 22, 1973, Ser. No. 372,626

Claims priority, application Great Britain, June 22, 1972, 29226/72

Int. Cl. H03b *3/04*

U.S. Cl. 331—4 **4 Claims**

1. An oscillation generator including a voltage tunable oscillator; a first phase comparator connected to compare output from said oscillator with a reference frequency; a second phase comparator connected to compare output from said first comparator with an off-set frequency; a third phase comparator having two input channels one fed from the first phase comparator and the other fed with the off-set frequency, one of said input channels having a phase shift of 90° relative to that of the other; a sweep or search oscillator;



means for stopping said sweep oscillator sweeping if, and only if, the output of said third comparator is of a predetermined sign; means for combining output from said sweep oscillator with output derived from said second comparator; and means for utilising output from said combining means to control the tuning of said tunable oscillator.

3,852,683

ARYLIDENE DYE LASERS

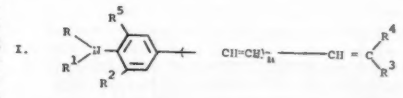
Frank G. Webster, and William C. McColgin, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

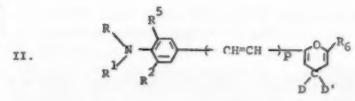
Continuation-in-part of Ser. No. 190,330, Oct. 18, 1971, abandoned. This application Sept. 1, 1972, Ser. No. 285,701

Int. Cl. H01s *3/00*

U.S. Cl. 331—94.5 L **20 Claims**

1. In a dye laser comprising means containing a laser dye solution and a pumping energy source operably coupled therewith for producing a population inversion in said solution and means optically coupled with said solution for stimulating emission therefrom during said population inversion, the improvement of having said solution comprise, in a lasing concentration and in a non-interfering solvent, a lasing dye having a formula as follows:





wherein:

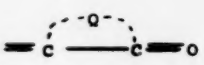
n represents an integer having a value of 0, 1 or 2;

p represents an integer having a value of 1 or 2;

R and R^1 each represent a hydrogen atom or an alkyl radical and when R and R^5 or R^1 and R^2 are taken together, represent the atoms necessary to complete, together with the phenylene radical to which the nitrogen is attached, a julolidyl radical, a 5-indolinyl radical, a 6-(1,2,3,4-tetrahydroquinolyl) radical, or a 3-carbazolyl radical;

R^2 and R^5 each represent a hydrogen atom when R^1 or R, respectively, is a hydrogen atom or an alkyl radical;

R^3, R^4, D and D' each represent a member selected from the group consisting of a cyano radical, an alkoxycarbonyl radical, an acyl radical, a substituted sulfonyl radical and when R^3 and R^4 or D and D' are taken together with the carbon atom to which they are attached, represent a radical of the structure:



in which Q represents the non-metallic atoms necessary to complete a 5- or 6-membered nucleus selected from the group consisting of an isoxazolinone nucleus, an oxindole nucleus, a 2,4,6-triketohexa-hydropyrimidine nucleus, a 2(3H)-imidazo[1,2-a]pyridone nucleus, a 5,7-dioxo-6,7-dihydro-5-thiazolo[3,2-a]pyrimidine nucleus, a 2-thio-2,4-oxazolidinedione nucleus, a thianaphthenone nucleus, a 2-thio-2,5-thiazolidinedione nucleus, a 2,4-thiazolidinedione nucleus, a thiazolidinone nucleus, a 4-thiazolinone nucleus, a 2-imino-2-oxazolin-4-one nucleus, a 2,4-imidazolidinedione nucleus, a 1,3-indanedione nucleus, a dioxanedione nucleus and a pyrantetrone nucleus; and

R^6 represents a hydrogen atom, an alkyl radical or a monocyclic aryl radical.

3,852,684

LASER DEVICE COMPRISING A COMPOUND OSCILLATOR AND AMPLIFIER FOR GENERATING THE FUNDAMENTAL MODE

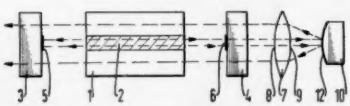
Dieter Roess, Planegg, and Guenter Ziedler, Unterpfaffenhofen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Apr. 4, 1973, Ser. No. 347,781

Claims priority, application Germany, Apr. 28, 1972, 2221057

Int. Cl. H01s *3/08*

U.S. Cl. 331—94.5 **8 Claims**



1. A laser device for generating and amplifying a laser of a fundamental mode, comprising a body of laser active material, an optical resonator including a pair of mirrors with the body of laser active material being positioned therebetween, said pair of mirrors having their cross sectional dimension less than the cross sectional dimension of the laser active material so that only a portion of the laser active material coacts with the pair of mirrors to form a fundamental mode oscillator with the remaining portion of the body of material being an amplifier portion, one of said pair of mirrors being partially transparent to decouple a beam from the resonator, and means being positioned to receive the beam decoupled from the resonator through the one mirror and to direct the decoupled beam through the amplifier portion of the laser active material for amplification of the beam.

3,852,685

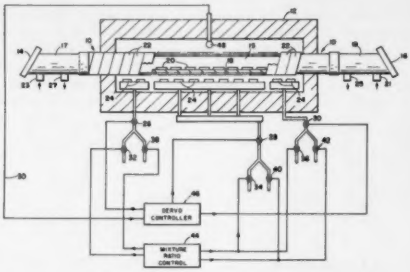
HEATING MEANS FOR METAL VAPOR LASERS

John J. Ehrlich, and Pasquale Martignoni, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 27, 1973, Ser. No. 383,205

Int. Cl. H01s *3/22*

U.S. Cl. 331—94.5 **2 Claims**



1. In a metallic vapor gas laser, the combination comprising:

a ceramic tube,

metallic chips in said tube to be vaporized,

a furnace structure surrounding said tube,

a plurality of gas burners in the lower portion of said furnace,

a supply of oxygen for said burners,

a supply of fuel gas for said burners,

means for individually controlling the flow of fuel gas and oxygen to said burners,

a temperature sensing device in said furnace,

means connecting said temperature sensing device to said flow control means to automatically control the temperature in said furnace,

a metal plate located in said ceramic tube, said plate having a higher melting point than said metallic chips and being capable of being wetted by the molten metal of said chips, and

a strip of tantalum foil spirally wound about the outer surface of said ceramic tube to distribute the heat evenly over said tube and to act as a coaxial ground path for the discharge current of said laser.

3,852,686

AUTOMATIC FREQUENCY CONTROL CIRCUIT

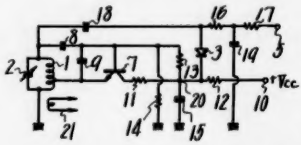
Kokichi Morii, Chigasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 21, 1973, Ser. No. 417,782

Claims priority, application Japan, Nov. 25, 1972, 47-135637

Int. Cl. H03c *3/22*

U.S. Cl. 331—177 V **5 Claims**



1. An automatic frequency control circuit, comprising:

an L-C resonant circuit;

a transistor connected to said L-C resonant circuit to

thereby form an oscillator circuit, said transistor including a collector electrode connected to the base electrode thereof by a DC feedback path;

a source of energizing potential coupled to the collector electrode of said transistor by first resistance means for supplying an energizing potential thereto;

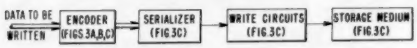
varicap diode means connected in AC parallel relationship to the capacitance means of said L-C resonant circuit, said varicap diode means being further connected to the collector electrode of transistor to receive a reverse bias voltage therefrom; and

means for supplying a frequency controlling signal to said varicap diode means to vary the capacitance thereof, whereby the oscillating frequency of said oscillating circuit is correspondingly varied.

3,852,687
HIGH RATE DIGITAL MODULATION/DEMODULATION METHOD AND MEANS

Paul Hodges, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 2, 1973, Ser. No. 375,405
Int. Cl. H03k *13/17*
U.S. Cl. 332—11 R **6 Claims**



1. Electrical apparatus for modulating an electrical wave with each received byte containing first and second groups of electrical bit signals, the modulated electrical wave having minimum and maximum multiple clock periods of run-length-limited coding, comprising

a clock circuit for generating a set of electrical timing pulses for each received byte to sequentially signal a plurality of clock periods in first and second sequential clock pulse sections,

an encoder circuit having first and second parts respectively receiving the first and second groups of electrical bit signals and the timing pulses of the first and second sequential clock pulse sections,

the first part in said encoder circuit having means for switching a first electrical waveform between two electrical levels with the first group of electrical bit signals and the timing pulses of the first sequential clock pulse section to generate a different electrical waveform for each different combination of electrical bit signals in said first group, the electrical switchings in the first waveform being spaced by at least two clock periods during said first sequential clock pulse section, and said first waveform excluding a bounding clock period of the first section,

the second part in said encoder circuit having means for switching a second electrical waveform between two electrical levels with the second group of electrical bit signals and the timing pulses of the second sequential clock pulse section to generate a different electrical waveform for each combination of electrical bit signals in the second group, the electrical switchings in the second waveform being spaced by at least two clock periods during said second sequential clock pulse section, and said second waveform excluding a bounding clock period of the second section,

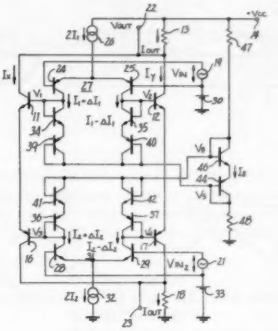
third and fourth means in said first and second parts, respectively, for further switching the electrical level during each bounding clock period in the first and second electrical waveforms if no switching occurs in any clock period adjacent to each bounding clock period, and

serializer means connected to an output of said first and second parts to sequentially connect the first and second electrical waveforms as the modulated output signal for each received byte.

3,852,688
TRANSISTOR CIRCUIT

Masashi Takeda, Isehara, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 9, 1973, Ser. No. 387,181
Claims priority, application Japan, Aug. 11, 1972, 47-80524
Int. Cl. 332 *43 B;* **H03c** *1/54*
U.S. Cl. 332—31 T **4 Claims**



1. A transistor circuit comprising:

A. a first pair of transistors comprising first and second transistors of one conductivity type, each having base, emitter, and collector electrodes;

B. a second pair of transistors comprising third and fourth transistors of the opposite conductivity type and each having base, emitter and collector electrodes;

C. a load impedance, the collector electrodes of said first pair of transistors being connected thereto, said load impedance being connected in series between said collector electrodes of said first pair of transistors and a power supply terminal to receive direct current from said terminal;

D. means for connecting the emitter electrodes of said first and second transistors to the emitter electrodes of said third and fourth transistors, respectively, the collector electrodes of said third and fourth transistors being connected to a second power supply terminal;

E. a first pair of converter circuits, each having a logarithmic input-output characteristic and being connected to the base electrodes of said first pair of transistors respectively;

F. a second pair of converter circuits, each having a logarithmic input-output characteristic and being connected to the base electrodes of said second pair of transistors respectively;

G. a first input signal source for supplying a first pair of opposite polarity signals to said first pair of converter circuits; and

H. a second input signal source for supplying a second pair of opposite polarity signals to the other of said pairs of converters.

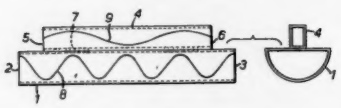
3,852,689
WAVEGUIDE COUPLERS

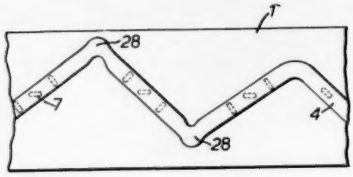
Barry Kenneth Watson, Witham, England, assignor to The Marconi Company Limited, Chelmsford, Essex, England

Filed Nov. 2, 1973, Ser. No. 412,503
Claims priority, application Great Britain, Nov. 4, 1972, 50949/72
Int. Cl. H01p *5/14*
U.S. Cl. 333—10 **20 Claims**

1. A waveguide coupler for coupling energy between two lengths of waveguide each capable of supporting electromag-

netic waves having phase velocities different from those supportable by the other, a common interconnecting wall between said two lengths which is such that one of the waveguides has a non-rectilinear form in the longitudinal direction such that the ratio of the non-rectilinear length of said one waveguide to the length of the other waveguide is substantially





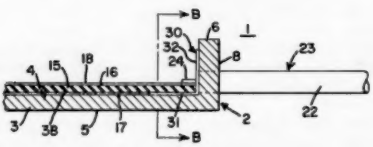
equal to the ratio of their respective phase velocities and wherein coupling apertures are provided in the common interconnecting wall so that energy from an incident electromagnetic wave in said non-rectilinear length of waveguide is capable of being coupled to the other waveguide, or vice versa, to produce a coupled output electromagnetic wave therein.

3,852,690

MICROWAVE TRANSMISSION LINE TO GROUND PLANE TRANSITION

Thomas Andrew Telfer, Clinton, N.Y., assignor to General Electric Company, Utica, N.Y.

Filed Jan. 2, 1973, Ser. No. 320,346
Int. Cl. H01p *3/08*
U.S. Cl. 333—84 M **4 Claims**



1. A method for providing a low resistance transition from a coaxial cable to a substrate having metallized circuit areas on both surfaces, one of the latter being a ground plane microwave circuit, comprising the steps of:

providing a strap of thin conductive material with an aperture near one end thereof;

conductively joining an end of said strap to said substrate ground plane circuit;

positioning said substrate on a conductive support member having a coaxial cable affixed thereto with the outer conductor electrically joined therewith, the aperture in said strap being aligned such that the center conductor of said cable extends therethrough;

bonding said substrate and said strap to said support member; and

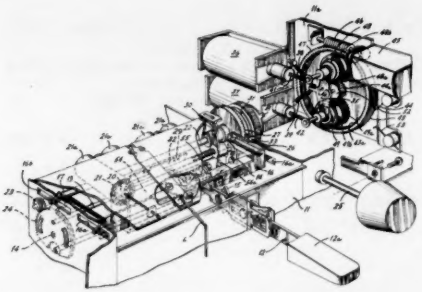
conductively joining said center conductor to a circuit area on said substrate located on the opposite side of said substrate from, and in registration with, the portion of said ground plane circuit which is bonded to said strap.

3,852,691

MOTORIZED RADIO SEARCH TUNER

Howard A. Kell, Jr.; Eugene W. Yeager, both of Lansdale, Pa., and Allen A. Manteghian, Sao Paulo, Brazil, assignors to Philco-Ford Corporation, Blue Bell, Pa.

Filed Jan. 25, 1974, Ser. No. 436,794
Int. Cl. H03j *1/08, 1/12*
U.S. Cl. 334—19 **11 Claims**



1. In radio receiving apparatus of the type including adjustable means for tuning over a predetermined band of frequencies, improved drive means for moving said tuning means at a relatively slow rate for tuning in one direction of travel and at a relatively rapid rate for repositioning in the opposite direction, said drive means comprising: a unidirectionally rotatable motor; a lever; first and second solenoid means coupled with said lever, each selectively energizable to rock said lever in one or the other direction; first and second drive wheel means, of different diameters, driven by said motor; and a pair of idler wheels on said lever, one idler wheel being driven by said first drive wheel means of larger diameter, the other idler wheel being driven by said second drive wheel means of lesser diameter, said lever being operable to move said other idler wheel into driving engagement with the tuning means, to provide a relatively slow drive coupling between said first drive wheel means and said tuning means, upon energization of said first solenoid means to rock said lever in one direction, and said lever being operable to move said one idler wheel into driving engagement with the tuning means, to provide a relatively rapid drive coupling between said second drive wheel means and said tuning means, upon energization of said second solenoid means to rock said lever in the other direction.

3,852,692

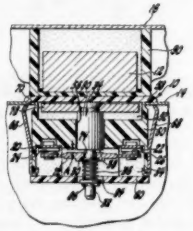
MAGNETICALLY OPERATING SWITCH

Earl J. Moorman, 231 Ashwood Ave., Dayton, Ohio 45405

Filed Feb. 19, 1974, Ser. No. 443,803
Int. Cl. H01h *9/00*
U.S. Cl. 335—205 **5 Claims**

1. In a domestic clothes washer, the combination of a clothes washer wall having an access opening, an access lid hingedly mounted with respect to said wall along one edge of said lid and adapted to close said access opening when a movable edge of said lid lies adjacent said wall, a magnet located on said movable edge, and a magnetically operated switch located adjacent said magnet when said access lid is closed, said switch comprising a switch housing of nonmag-

netic material in fixed relation to said wall and generally imperforate to moisture and access through said wall in the vicinity of said access opening, a pair of stationary contacts in said housing adapted to be electrically connected in the power supply circuit of said clothes washer, a pair of movable contacts in said housing for electrically bridging said stationary contacts to close said power supply circuit, and support means for said pair of movable contacts axially movable in said housing in two directions, said support means including as a unit an actuating plate portion, impact portion, shaft portion and spring, said spring having one end supported on said shaft portion and another end yieldingly supporting said pair of movable contacts between said spring and said impact portion, said actuating plate portion being of magnetic material axially movable in response to the presence of said magnet when said access lid is closed for axially moving said support means in one direction to move said movable contacts into bridging relation with said stationary contacts, said support means axially movable in the opposite direction in response to the absence of said magnet when said access lid is open to



move said movable contacts out of bridging relation with said stationary contacts, said shaft portion loosely interfitting with said pair of movable contacts and axially movable relative thereto, said impact portion having a shoulder spaced a predetermined distance from said pair of movable contacts when said access lid is closed to condition the shoulder of said impact portion for impacting on said pair of movable contacts when said access lid is opened, said spring supporting said pair of movable contacts against said shoulder when said access lid is open, said spring maintaining the bridging relation of said pair of movable contacts with said stationary contacts after the axial movement of said support means in said one direction when said access lid is closed and inducing the axial movement of said support means in the opposite direction to cause said shoulder to impact on said pair of movable contacts when the access lid is opened, the mass of said support means in cooperation with said predetermined distance and the rate of said spring being sufficient to suddenly and surely break the bridging relation and any tack welding of said movable contacts with said stationary contacts, thereby to open the power supply circuit as soon as said access lid is opened.

3,852,693

MAGNETIC CONVERGENCE DEVICE FOR CATHODE RAY TUBES

Walter A. Schwalm, 745 Barberry Ln., Lake Forest, Ill. 60045

Filed Dec. 4, 1973, Ser. No. 421,675
Int. Cl. H01f *1/00*
U.S. Cl. 335—212 **14 Claims**

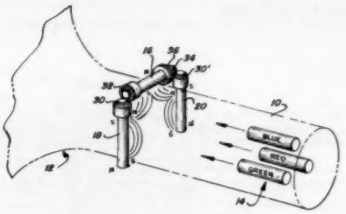
1. A magnetic convergence device for a cathode ray tube having electron gun means for developing three electron beams, which comprises:

a first magnetic member;

a second magnetic member;

a third magnetic member;

said second and third magnetic members being spaced from each other and being coupled to said first magnetic member with the axes of said second and third magnetic members extending angularly with respect to the axis of said first magnetic member; and



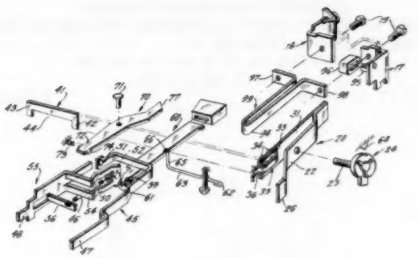
means coupling said first, second and third magnetic members, whereby rotation of one of said magnetic members about its axis will result in simultaneous rotation of the other two magnetic members about their respective axes.

3,852,694

OVERLOAD RELAY WITH FAST ACTING BIMETAL ON HIGH CURRENT

Bernard Di Marco, Bellefontaine, and Andrew J. Kralik, Marysville, both of Ohio, assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Dec. 26, 1973, Ser. No. 428,097
Int. Cl. H01h *71/16, 61/02*
U.S. Cl. 337—62 **5 Claims**

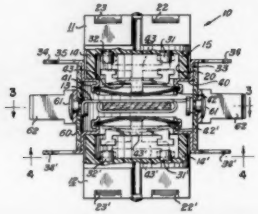


1. A switch device including cooperating contacts mounted for operation between first and second positions wherein said contacts are engaged and disengaged, respectively; first means operatively connected to said contacts for moving same between said positions; bimetal means which upon predetermined deflection thereof in a first direction operates said first means to move said contacts from one to the other of said positions; said bimetal means including a main bimetal and an auxiliary bimetal; said main bimetal upon heating thereof contributing a component of deflection in said first direction to said bimetal means; said auxiliary bimetal upon heating thereof contributing a component of deflection to said bimetal means in a second direction opposite to said first direction; heater means positioned adjacent said bimetal means for heating both the main and auxiliary bimetals by convection during normal overload conditions; said main bimetal being interposed between said heater means and said auxiliary bimetal to substantially shield the latter from direct radiation of heat limited by said heater means whereby upon extremely rapid heating of said heater means said bimetal means undergoes said predetermined deflection during a period of time when deflection of said auxiliary bimetal relative to said main bimetal is much less than during normal overload heating of the bimetal means.

3,852,695
ELECTRICAL SWITCHING SYSTEM

Leonard L. Northrup, Jr., 4312 Westway, Dallas, Tex. 75205

Filed Apr. 9, 1973, Ser. No. 349,253
Int. Cl. H01h 61/00
U.S. Cl. 337—102 10 Claims

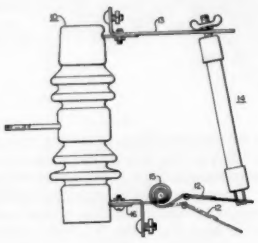


1. An electrical switching system comprising: an electrically activated pilot heater connectible with and responsive to a thermostat; and a plurality of heat-responsive electrical switches supported in spaced relation to said pilot heater each switch being electrically connected with separate circuits independent of the circuit including said pilot heater for controlling circuit connected with said switches in response to heat sensed by said switches from said pilot heater whereby said circuits connected with said switches are energized and de-energized responsive to the temperature sensed by said thermostat.

3,852,696
DROPOUT ELECTRICAL FUSE

Frank L. Cameron, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 10, 1973, Ser. No. 405,196
Int. Cl. H01h 85/36
U.S. Cl. 337—240 8 Claims

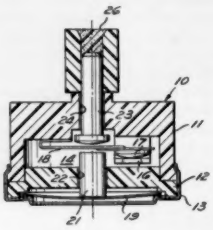


1. A dropout fuse structure comprising a fuse tube, first and second ferrules at the ends of the fuse tube, a core composed of electrically insulating material, the core having a first bore, a plug in at least one end of the bore, each plug having a second bore, a fusible strain element extending through the first bore and having opposite end portions in operative electrical contact with the corresponding ferrules, a fuse element mounted on the exterior of the core and having opposite end portions secured to the corresponding ferrules, an end portion of the fusible strain element extending into the second bore of a plug, a conductor connected to said end portion of the fusible strain element and extending outwardly from the plug, and an axially movable member secured to the conductor operative to dislodge the conductor from the plug upon fusion of the fusible strain element.

3,852,697
BIMETAL SNAP DISC

Harold F. Snider, Mansfield, Ohio, assignor to Therm-O-Disc Incorporated, Mansfield, Ohio

Filed July 11, 1973, Ser. No. 378,256
Int. Cl. H01h 37/74
U.S. Cl. 337—348 10 Claims

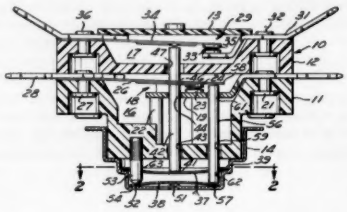


1. A snap disc comprising a piece of bimetal formed of a material having a deflection curve which is positive as the temperature of the material varies from a predetermined temperature in either direction said disc having a portion formed with a shallow dished shape, said disc providing two positions of stability between which it moves for snap action, said disc when in said first position snapping to said second position upon reaching a calibration temperature different than said predetermined temperature.

3,852,698
DUAL TEMPERATURE THERMOSTAT

Donald J. Schmitt, Mansfield, and Richard M. Anderson, Shelby, both of Ohio, assignors to Therm-O-Disc Incorporated, Mansfield, Ohio

Filed July 23, 1973, Ser. No. 381,914
Int. Cl. H01h 37/52
U.S. Cl. 337—354 23 Claims

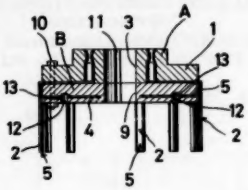


1. A thermostat comprising a body assembly, first and second switches mounted on said body assembly, first and second bimetal snap discs on said body assembly, said first disc being supported at its periphery and providing a central portion movable with snap action in response to temperature changes, said first switch providing first means operating said first switch in response to movement of said central portion, said second disc being mounted at its center and at one peripheral location and providing a peripheral portion movable with snap action in response to temperature changes, said second switch providing second means operating said second switch in response to movement of said peripheral portion.

3,852,699
TUBE SOCKET HAVING A PLURALITY OF ELECTRICAL DISCHARGE GAPS

Selichi Kimura; Takao Suzuki, and Masahiro Nakajima, all of Takasaki, Japan, assignors to Taiyo Yuden Kabushiki Kaisha, Tokyo, Japan

Filed July 16, 1973, Ser. No. 379,729
Claims priority, application Japan, July 18, 1972, 47-71228
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 T **3 Claims**



1. A socket having electrical discharging gaps, comprising a first member including a plurality of tubular connecting pins for receiving electrodes of a Braun tube or the like; an insulating material base plate having said pins circularly disposed and embedded therein, leg portions extending respectively from each of said connecting pins and extending radially to the perimeter of said base plate, and then extending axially exteriorly and normal to a rear surface of said base plate; and a second member having a plurality of terminal members corresponding in number and spatial positioning to said connecting pins, a single grounding terminal member, a second insulating material base plate having said terminal members and a grounding terminal member disposed radially and embedded therein; leg portions respectively extending from said terminal members and from said grounding terminal member extending exteriorly of said second base plate, said first and second members being in superimposed relationship so as to facilitate the leg portions of the connecting pins of said first member and the leg portions of the terminal members of said second member to be respectively mechanically and electrically interconnected, said terminal members being shaped to form said electrical discharging gaps within the base plate of said second member.

3,852,700
GROUNDING BASE FOR CONNECTOR

Edward Leon Haws, Houston, Tex., assignor to Michael P. Breston, Houston, Tex.

Continuation of Ser. No. 817,476, April 18, 1969, abandoned. This application Apr. 30, 1973, Ser. No. 356,254
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 R **2 Claims**

1. A coaxial electrical connector assembly comprising:

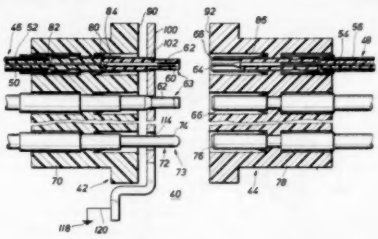
a. a pair of cooperable plug members carrying a plurality of coaxially-engageable, pin-and-socket connector elements in opposed end faces of the plug members;

b. certain ones of the said connector elements having mating ends extending outwardly of said end face of said plug member, each said pin element having a conically-tapered, enlarged-diameter portion spaced inwardly from said mating end, said diameter of said tapered portion increasing in the direction away from said mating end;

c. a thin, flexible metal grounding plate separate from said plug members disposed in between the opposed end faces of said plug members;

d. the body of said grounding plate defining a sufficient number of insert-free, cylindrical holes to permit passage therethrough of all of the connector pin elements projecting outwardly from said plug member; and

e. the diameters of the individual holes being made such that when the plug members are moved into mating engagement with each other, said tapered portions of said connector pin elements become engaged in wedging pressure contact with the encircling walls of their mating holes, of said grounding plate while one side of said plate

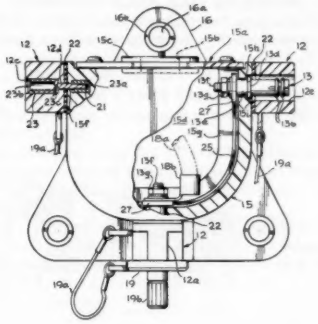


remains spaced from said end face of said plug member containing said pin elements, and while said other end face of said other plug member engages the opposite side of said plate, each such pressure contact establishing a mechanical and electrical contact with the grounding plate.

3,852,701
POWER CONNECTION SYSTEM

Lee Minitz, Granada Hills, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 10, 1972, Ser. No. 296,417
Int. Cl. H01r *13/62*
U.S. Cl. 339—64 M **14 Claims**



1. In combination:

an electrical contact supporting structure having a contact receiving hole,

an electrical terminal disposed adjacent said contact receiving hole,

a contact disposed in said contact receiving hole,

means for securing said contact to said terminal,

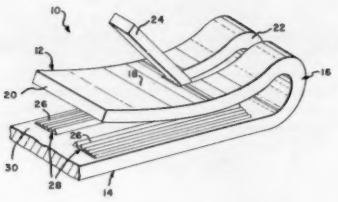
said contact and said means for securing being constructed and arranged in conjunction with said contact receiving hole in a manner so as to permit movement of the secured terminal and contact relative to said supporting structure, and

resilient means connected to said terminal for providing resiliency of said movement of the secured terminal and contact.

3,852,702
ELECTRICAL TERMINAL HAVING PYRAMID TEETH THEREON

Edward Camp Dowling, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed July 27, 1973, Ser. No. 383,368
Int. Cl. H01r *11/20*
U.S. Cl. 339—97 R **6 Claims**



1. An electrical terminal for electrical wire, which comprises:

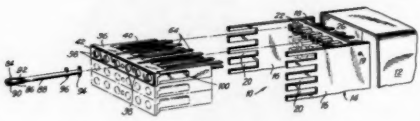
a. an elongated shank having a plurality of parallel, elongated teeth extending axially along one surface with each tooth being progressively different in height relative to the next tooth, and the shank further having an elongated tab extending generally upwardly from the one surface;

b. an elongated leg positioned movably over the shank and hinged thereto, said leg having an opening therein with said tab extending therethrough so that as the tab is bent against the leg and toward the shank, the leg approaches the one surface of the shank and pushes an electrical wire which may be lying across the shank into electrical and mechanical engagement with the teeth.

3,852,703
MODULAR JACK STRIP ASSEMBLY

William V. Carney, Valley Stream, and Paul V. Deluca, Port Washington, both of N.Y., assignors to Porta Systems, Roslyn, N.Y.

Filed Jan. 5, 1973, Ser. No. 321,365
Int. Cl. H01r *9/00*
U.S. Cl. 339—198 H **19 Claims**



1. A modular jack strip assembly comprising

a housing assembly, and

a plurality of modular jack strips,

said housing assembly including

a mounting plate member, and

jack strip mounting means connected to said mounting plate member said housing assembly being adapted to receive said plurality of modular jack strips,

each of said jack strips comprising an insulated structure having a plurality of individual jack terminals each terminal having at least one electrical contact finger extending outwardly of said terminals,

a plurality of electrical contact members positionally secured to said mounting plate member in a predetermined array,

each of said jack strips including mounting members connected therewith,

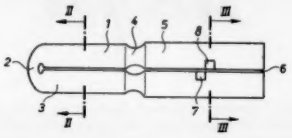
said jack strip mounting members being secured with said jack strip mounting means to positionally secure said jack strips with respect to said housing assembly, and

corresponding ones of said electrical contact fingers being disposed in seated engagement with corresponding ones of said electrical contact members.

3,852,704
ELECTRICAL PLUG-AND-SOCKET-CONNECTOR, ESPECIALLY FOR COMMUNICATIONS ENGINEERING APPLICATIONS

Edwin Muz, D 7519 Muhlbach Uhlandstrasse 8, Germany

Filed July 24, 1973, Ser. No. 382,060
Int. Cl. H01r *11/22*
U.S. Cl. 339—252 P **4 Claims**



1. An improved electrical connector, especially for communication equipment, comprising

a substantially tubular body having

a resiliently yielding plug portion at one end of the body, a socket portion at the other end of said body, and an intermediate portion connecting the two;

said body being formed from a single piece of metallic sheet material;

said socket portion having

substantially identical semicylindrical halves opening toward each other and extending from said intermediate portion to an open end,

said halves being circular in cross section and, together, defining a cylindrical volume,

said halves terminating in longitudinally extending parallel edges defining two longitudinal slits; and

said plug portion having

a tip in the shape of a hollow hemisphere, and

substantially identical semicylindrical halves opening toward each other and extending between said tip and said intermediate portion;

said identical halves terminating in longitudinally extending parallel edges defining longitudinal slits aligned with the slits in said socket portion,

said halves each being elliptical in cross section, the major axis of the ellipse formed by said halves being larger, and the minor axis thereof being smaller than the inner diameter of the cylindrical volume defined by the halves of said socket portion.

3,852,705
SONAR DEPTH TRACKING SYSTEM

William R. Backman, Jr., Portsmouth, and George M. Walsh, Middletown, both of R.I., assignors to Raytheon Company, Lexington, Mass., by said George M. Walsh

Continuation of Ser. No. 146,729, May 25, 1974, abandoned. This application Mar. 26, 1973, Ser. No. 345,026
Int. Cl. G01s *9/68, 7/66*
U.S. Cl. 340—3 R **22 Claims**

1. In combination:

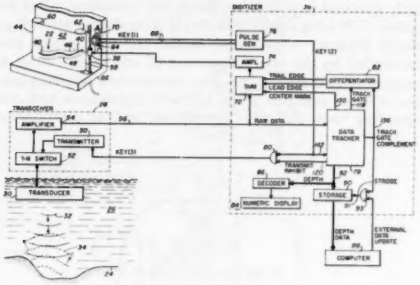
means for transmitting sequential quanta of radiant energy towards an energy reflecting subject;

means responsive to quanta of radiant energy reflected from said subject for recording the occurrences of said reflec-

tions as a function of the distance from said transmitting means to said subject;

means for estimating a range of values of said distance for a succeeding reflection of said energy; and

means for displaying said estimate superposed about a recording of said succeeding reflection, said displaying



means including means for displaying a sequence of past values of said estimates superposed about a sequence of past values of the recordings of said occurrences of said reflections simultaneously with said displaying of said estimate superposed about said recording of said succeeding reflection.

3,852,706

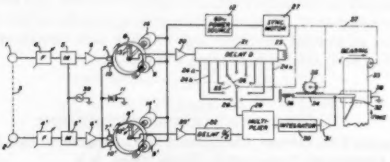
OBJECT LOCATION SYSTEM

Harold L. Barney, Madison, and Edward E. David, Jr., Berkeley Hts., both of N.J., assignors to Bell Telephone Laboratories, Inc., New York, N.Y.

Filed June 10, 1955, Ser. No. 514,417

Int. Cl. G01s *3/80*

U.S. Cl. 340—6 R **15 Claims**



1. Apparatus for locating a source of radiations through ambient noise of substantial strength, which comprises at least two transducers, spaced apart, means individual to each of said transducers for continuously recording its output on a recording medium, means for rapidly and repeatedly scanning each of said recording media to derive a time signal which is expanded in frequency and compressed in time as compared with that of said source, means for variously delaying one of said time signals relatively to the other, means for comparing said time signals for various values of said delay, means for deriving from said comparing means a measure of the degree of similarity of said time signals, whereby said measure reaches an extreme value when said time signals are coincident in time, and means for indicating the magnitude of said relative delay for which said measure attains said extreme value.

3,852,707

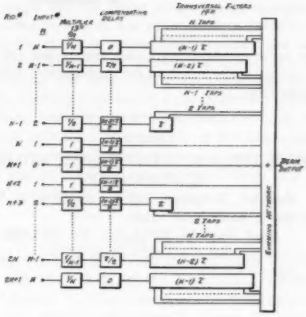
SONAR BROADBAND CONSTANT BEAMWIDTH SHADING NETWORK

Samuel W. Autrey, Fullerton, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 23, 1968, Ser. No. 707,595

Int. Cl. G01s *3/80*

U.S. Cl. 340—6 R **3 Claims**



1. In a linear equispaced hydrophone array of 2N+1 hydrophones connected to a beamformer, a beamwidth shading network disposed between said beamformer and a summing network which comprises:

an input terminal for each output of said beamformer corresponding to one of said hydrophones, said input for the center reference hydrophone being designated as "O" and each of said terminals being designated by the number of terminals therebetween including said reference terminal, the end terminals being designated N,

a linear series connected signal path for each of said input terminals which includes,

a multiplier having a factor $1/n$, where n designates said input terminal except said center terminal having a factor of unity,

a compensating delay of $((N-n)/2)\tau$, where τ = sine of the energy arrival angle divided by the frequency for which the spacing of adjacent hydrophones is one-half wavelength,

a linear delay means having a total delay of $(n-1)\tau$ and n equal tap outputs,

said tap outputs connected to the input of said summing network.

3,852,708

MULTIPLE ELEMENT PHASED ARRAY WITH SHADED SUB-ELEMENT GROUPS

Richard D. Doolittle, Washington, D.C., and John A. Dorr, Crofton, Md., assignors to Chesapeake Instrument Corporation, Shady Side, Md.

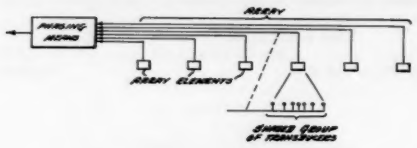
Filed Jan. 24, 1972, Ser. No. 219,939

Int. Cl. G01v *1/38*

U.S. Cl. 340—7 R **19 Claims**

1. A linear signal receiving array of grouped transducers comprising a plurality of substantially co-linear spaced-apart array elements adapted to respond to incident signals as a linear towed array in a liquid medium wherein each of said elements in the linear array itself comprises a group of substantially co-linear individual transducers forming a second linear array within every element and wherein the second

linear arrays within said elements are shaded to reduce their end-fire response characteristics with respect to locally generated tow noise propagating along and within the array at a velocity substantially less than the propagation velocity of said incident signals.



3,852,709

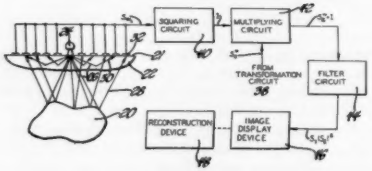
METHOD & APPARATUS FOR SEISMIC HOLOGRAPHIC EXPLORATION

Rolf K. Mueller, Brighton, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 25, 1972, Ser. No. 283,888

Int. Cl. G01v *1/34, 1/28*

U.S. Cl. 340—15.5 DS **18 Claims**



1. A method of developing a hologram of a subterraneously disposed object displaced beneath a mask comprising the steps of:

irradiating the object and the mask with coherent acoustic energy of a first predetermined frequency selected to permit penetration of the coherent acoustic energy through the mask and to the object;

detecting the energy reflected from both the object and the mask at the first predetermined frequency;

irradiating the mask with coherent acoustic energy of a second predetermined frequency selected to permit penetration of the coherent acoustic energy to the mask only;

processing the reflected energy so as to remove the mask component from the energy reflected both from the object and the mask and thereby develop an output having an enhanced image component representing the object only; and

displaying the enhanced image component to develop a hologram of the object.

3,852,710

AIRCRAFT GYROHORIZON INDICATOR WITH SIGNAL LAMP POSITIONAL ATTITUDE INDICATING MEANS

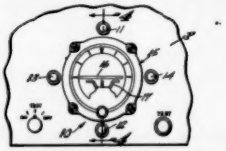
Ralph Hernandez, Jr., Miami, Fla., assignor to Aircraft Instruments, Inc., Miami Beach, Fla.

Continuation of Ser. No. 854,633, Sept. 2, 1969, abandoned. This application June 13, 1972, Ser. No. 272,935

Int. Cl. G08g *5/00*

U.S. Cl. 340—27 AT **2 Claims**

1. A device for signalling departure beyond predetermined limits from straight and level flight as indicated by the dial of a gyrohorizon instrument having a casing, an outer gimbal pivotally journalled within the casing, the relative rotational position thereof, with respect to the casing, being determinative of deviation of an aircraft in the roll axis, and an inner gimbal, pivotally journalled within the outer gimbal about an axis perpendicular to the journal axis of the outer gimbal, the relative rotational position thereof, with respect to the outer gimbal, being determinative of deviation of an aircraft in the pitch axis; the combination comprising, a first pair of signal lamps indicating, when energized, "nose up" and "nose down" aircraft positional attitude, respectively, in the pitch axis, a second pair of signal lamps for indicating, when energized, "left wing down" and "right wing down" aircraft positional attitude, respectively, in the roll axis, a first means controlled by the relative position of said inner gimbal with respect to said outer gimbal for selectively energizing one or the other of said first signal lamps in accordance with corresponding "nose up" and "nose down" aircraft positional attitude, and a second means controlled by the relative position of said outer gimbal with respect to said casing for selectively energizing one or the other of said second pair of signal lamps in accordance with corresponding "left wing down" and "right wing down" aircraft positional attitude, said first pair of signal lamps being mounted directly above and below the indicating dial of the gyrohorizon instrument in an aircraft panel, and said second pair of signal lamps being mounted directly at each side of said instrument dial, said first and second energizing means including an audible signal device and means for simultaneously energizing said audible signal device upon the energization of any one of the said signal lamps, both said audible signal device and said first and second pair of signal lamps thereby serving as a warning that the aircraft has departed from safe flight parameters, said first and second pair of signal lamps also serving to indicate the direction of aircraft deviation and whether such deviation is in pitch or in roll, or both pitch and roll.



3,852,711

ALTITUDE ALERTING INSTRUMENT

Leonard M. Greene, Chappaqua, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

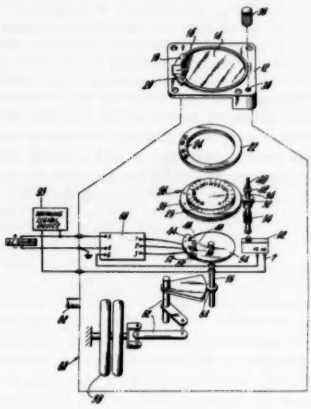
Continuation-in-part of Ser. No. 204,052, Dec. 2, 1971, abandoned. This application Nov. 21, 1972, Ser. No. 308,568

Int. Cl. G08g *5/00*

U.S. Cl. 340—27 R **10 Claims**

1. An aircraft altitude alerting instrument settable in accordance with a prevailing sea level pressure reference, said instrument comprising a stationary pressure reference element having thereon a scale of pressure markings, a pressure reference marker, means mounting said pressure reference marker for manual movement relative to said stationary pressure reference element, said pressure reference marker being adjacent to said stationary pressure reference element, an altitude setting element movable relative to said pressure reference element and being adjacent thereto and adjacent to said pressure reference marker, said altitude setting element including a scale of altitude markings thereon, means for manually moving said altitude setting element so that a selected altitude reading thereon is immediately adjacent said pressure reference marker whereby said pressure reference

marker can be moved to a pressure marking on said pressure reference element which corresponds to a prevailing sea level pressure and said altitude setting element can then be moved by said moving means so that a selected altitude on said altitude setting element is adjacent said pressure reference marker, a warning signal device, and means responsive to the static pressure outside the aircraft and coupled to said altitude setting element moving means for activating said warning signal device.

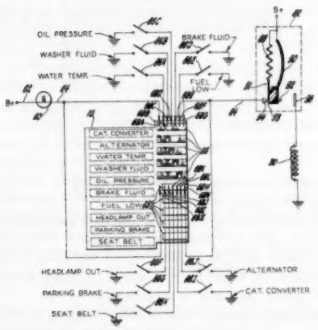


3,852,712

AUTOMOTIVE VEHICLE ROTARY DISPLAY DEVICE FOR INDICATING THE OCCURRENCE OF A SINGLE OR A PLURALITY OF EVENTS

Roy G. Hynes, Flushing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1973, Ser. No. 384,482
Int. Cl. G08b 19/00
U.S. Cl. 340—52 F 3 Claims



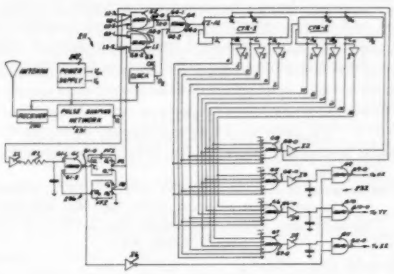
1. An automotive vehicle rotary display device for indicating the occurrence of events at remote locations in the vehicle, comprising: a plurality of event sensors positioned at remote locations in the vehicle, each of said event sensors being responsive to the occurrence of a respective event for generating a signal upon said occurrence; a viewing window; a drum rotatably supported adjacent the viewing window; a plurality of messages spaced around the drum so as to be sequentially positioned adjacent the viewing window as the drum is indexed, each of said messages representing the occurrence of a respective one of the events; a lamp positioned within the drum; drive means for indexing the drum; and circuit means responsive to the angular position of the drum for coupling the event sensor responsive to the event represented by the message adjacent the viewing window to the lamp and coupling the remaining event sensors to the drive means, the lamp being energized by a signal generated by one of the event sensors coupled thereto for illuminating the message positioned adjacent the viewing window to thereby provide an indication of the occurrence of the event represented by said message and the drive means being energized by a signal generated by one of the event sensors coupled thereto for indexing the drum to sequentially position the messages thereon adjacent the viewing window, the drive means including delay means for maintaining each message positioned adjacent the viewing window for a predetermined time period when the drive means is energized to index the drum, whereby a continuous indication is provided of the occurrence of a single event and an indication having a predetermined time duration is provided for the occurrence of each of a plurality of events which has occurred.

3,852,713

ALARM SYSTEM HAVING PULSE PAIR CODING

Victor B. Roberts, 3969 Sentry Ave. N.E., Marietta, Ga. 30060; Charles V. Stephenson, 1993 Williamsburg Dr., Decatur, Ga. 30033, and Robert E. Good, Jr., 1955 Maple Dr., Kennesaw, Ga. 30144

Filed May 26, 1972, Ser. No. 257,307
Int. Cl. H04q 5/14
U.S. Cl. 340—164 R 12 Claims



1. An alarm system responsive to certain preconceived conditions to produce an alarm signal comprising:

transmitter means for generating a signal having pulse pairs with a prescribed time interval between said pulses of each said pulse pair upon occurrence of the preconceived conditions;

receiver means for detecting said generated signal and producing a corresponding operating signal output;

enabling means operatively connected to said receiver means for generating a reference enabling pulse a predetermined time interval after receipt of said first pulse of said pulse pair equal to said prescribed time interval between said pulses of each said pulse pair;

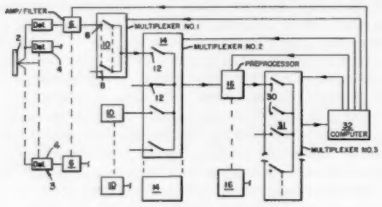
coincidence means operatively connected to said receiver means and said enabling means for generating an output signal pulse upon coincidingly receiving said reference enabling pulse and said second pulse of said pulse pair; and,

noise isolation means for preventing further receipt of pulses by said coincidence means from said receiver means after receipt of a second generated pulse from said receiver means after said first generated pulse for a second prescribed period of time.

3,852,714
ADAPTIVE IMAGING SYSTEM

John C. Carson, Newport Beach, Calif., assignor to Eocom Corporation, Newport Beach, Calif.

Filed June 22, 1972, Ser. No. 265,144
Int. Cl. G06k 9/00
U.S. Cl. 340—146.3 F 12 Claims



1. A sensor module comprising:

a plurality of electro-optical detector elements arranged in a two-dimensional array, each of said detector elements being divided into four electrically and optically distinct quadrants with the adjacent quadrants of each detector element being differently biased for enabling such adjacent quadrant to provide electrically different signals in response to radiation moving relative to such adjacent quadrants, and each quadrant having a reticle optically associated therewith,

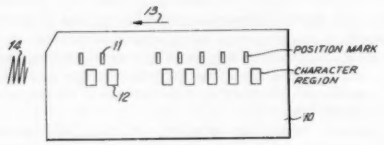
common amplifier means operatively associated with the four quadrants of each said detector element, and

circuit means coupled with the amplifier means of each detector element for detecting variations in signals from said detector elements as a function of radiation passing the reticle of a quadrant and as a function of radiation passing from quadrant to quadrant of a detector element.

3,852,715
CHARACTER RECOGNIZING SYSTEM

Naoki Morimoto, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 193,897, Oct. 29, 1971, abandoned.
This application Aug. 14, 1973, Ser. No. 388,230
Claims priority, application Japan, Nov. 2, 1970, 45-96580
Int. Cl. G06k 9/18
U.S. Cl. 340—146.3 Z 1 Claim

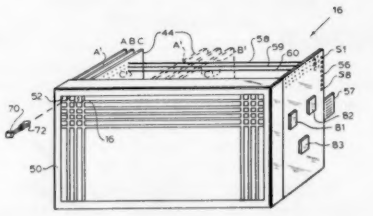


1. A character identification system, comprising read-out means which, from a slip having thereon at least one position mark, a character entry frame placed in a specific position relative to the position mark and at least one character entry guide point positioned within the character entry frame, reads out the position mark and characters within the character entry frame by raster scanning means; position mark detecting means for detecting the position mark prepared for determining the character entry position by using a signal obtained by the read-out means; horizontal position indicating means for indicating a character entry area in the direction of transfer of the slip, said slip having therein a character entry frame which shows the character entry area maintained in a specific positional relation with the position mark detected by the position mark detecting means and a position on a horizontal axis selecting a corner of the character entry range as an original point; vertical position indicating means for indicating the character entry range in the vertical direction of the character entry area determined by the direction of transfer of the slip or the position on the vertical axis selecting the corner in the character entry area as an original point; character detecting means for detecting a character crossing a position on a coordinate by detecting the coordinate position being scanned by the raster scanning means by means of the horizontal and vertical position indicating means and by detecting the presence or absence of a signal; a plurality of crossing detecting means, storage means connected to said crossing detecting means, said storage means storing the detection result of the character detecting means in said crossing detecting means obtained by detecting the character passing at least one coordinate position of a plurality of coordinate positions predetermined in the form of a plurality of radial lines between the coordinate position used as the character entry guide point within the character entry frame and each coordinate position forming the character entry frame; character extracting means for extracting the feature of a character within the character entry frame in accordance with the crossing conditions obtained by a plurality of the crossing detecting means of the storage means; and identifying means for identifying the character entered in the character entry area in accordance with the feature of the character provided by the character extracting means.

3,852,716
POINT-OF-SALE PROCESSING SYSTEM

Jerry A. Horn, Longwood, and Kermit L. Sawer, Altamonte Springs, both of Fla., assignors to Staid, Inc., Sanford, Fla.

Filed Mar. 2, 1973, Ser. No. 337,447
Int. Cl. G06f 9/02
U.S. Cl. 340—172.5 12 Claims



1. A data processing system comprising:

a. data processing means;

b. a keyboard having a plurality of keys arranged in an array of rows and columns, said keyboard being electrically coupled to said processing means and adapted to provide an electrical input thereto corresponding to one of said keys when such key is activated.

c. programming means electrically coupled to said processing means, said programming means including a plurality of substantially parallel printed circuit boards each having a plurality of individual conductive paths disposed on the front and back sides thereof, the conductive paths on one side being substantially transverse to the conductive paths on the opposing side; and wherein said conductive paths on said printed circuit boards define a row-column array such that each row-column intersection has a physical relationship which corresponds to a single key at a row-column intersection on said keyboard;

d. means for electrically scanning either of said keyboard rows and columns to sequentially detect activated keys and provide said input corresponding to each detected key; and

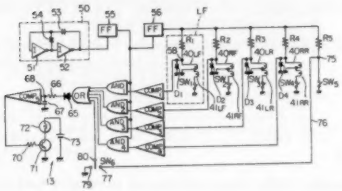
e. means for latching said scanning means until an output is provided from said keyboard into said processing means.

3,852,717

DEVICE FOR AUTOMATICALLY DETECTING ABNORMAL CONDITIONS IN VEHICLE TIRES

Akio Hosaka, Yokohama, and Kiyoshi Wazawa, Fujisawa, both of Japan, assignors to Nissan Motor Company Limited, Yokohama City, Japan

Filed Nov. 1, 1972, Ser. No. 302,721
Claims priority, application Japan, Nov. 22, 1971, 46-93825
Int. Cl. B60c *23/02*
U.S. Cl. 340—58 **3 Claims**



1. In a device for automatically detecting the loss of pressure and the abnormal increase of temperature within a pneumatic tire of wheeled vehicle, having a normally closed pressure switch to be opened when pressure in the tire is below a predetermined pressure value; a normally closed temperature switch to be opened when temperature of the tire is above a predetermined temperature value; coupling means comprising a primary coil and a secondary coil, the secondary coil being secured concentrically on an axle of the vehicle for rotation therewith and being electrically connnected in series with said pressure switch and said temperature switch, the primary coil being secured rigidly with respect to the frame of the vehicle and concentrically with respect to the secondary coil so that the primary coil exhibits an inductance change upon open of said switches; and warning means:

a clock pulse generator to produce clock pulses;

a first flip-flop connected to said clock pulse generator for providing, as its output, frequency division of said clock pulses;

a second flip-flop connected to said first flip-flop for providing, as its output, further frequency division of said clock pulses;

resistor electrically connecting said second flip-flop to said primary coil of said coupling means;

comparator gate means responsive to a voltage at a junction point between said resistor and said primary coil of said coupling means for providing a pulse output when said voltage is above a reference voltage;

AND logical function gate means connected to said first flip-flop and to said comparator gate means to receive outputs thereof, respectively, said AND logical function gate means being operable to provide a pulse output responsive to coincidence of inputs thereto; and

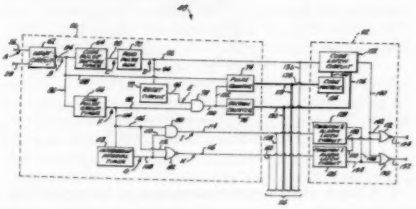
means responsive to said output pulse of said AND logical function gate means for energizing said warning means.

3,852,718

APPARATUS FOR INTERPRETING NUMERICALLY CODED PULSE GROUPINGS IN A LINE

Karl G. De Lyria, Vancouver, Wash., assignor to Hayward H. Dutton; Joseph Schulein and Margaret A. Schulein, all of Vancouver, Wash., part interest to each

Filed Oct. 25, 1973, Ser. No. 409,766
Int. Cl. G08b *25/00*
U.S. Cl. 340—164 R **6 Claims**



1. An interpreter for use in an electrical signaling system of the type which includes a transmission line and a plurality of coded signalers operatively connected to said line, each signaler being operable selectively to produce and transmit over said line one or more like-coded groups of time-spaced electrical pulses, with each such group including a plurality of pulse sections each containing one or more pulses depending upon the particular code associated with the signaler, with the times between adjacent pulses in a section under all circumstances being shorter than the times between adjacent sections in a group, and with the latter-mentioned times under all circumstances being shorter than the times between successive groups produced by the signaler, said interpreter in operative condition comprising

a code-reading circuit operatively coupled to said line and constructed to read the particular code of each coded group of pulses transmitted in the line,

a code-discriminating circuit for each different signaler in the system, each operatively connected to said code-reading circuit and operable to indicate a reading by the latter of the particular code associated with the code-reading circuit's associated signaler,

a pulse-group-spacing-monitoring circuit operatively coupled to said line and constructed to respond to the transmission therein of coded groups of pulses, and to generate, following the completion of such a group, a response of one type if another coded group of pulses follows within a preselected time span, and a response of another type if no such successive group follows within said preselected time span, and

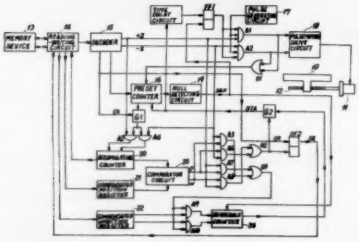
an output circuit for each code-discriminating circuit operatively connected thereto and to said pulse-group-spacing-monitoring circuit, each operable, with its associated code-discriminating circuit indicating a reading of its associated code, to produce an output signal of one type on said pulse-group-spacing-monitoring circuit generating a response of said one type, and to produce an output signal of another type on the pulse-group-spacing-monitoring circuit generating a response of said other type,

each output circuit including means inhibiting the simultaneous production thereby of both types of output signals.

3,852,719
PITCH ERROR COMPENSATION SYSTEM

Hideo Nishumura, and Kyosuke Haga, both of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Sept. 24, 1973, Ser. No. 399,913
Claims priority, application Japan, Sept. 23, 1972, 47-95463
Int. Cl. G06f *3/00, 15/46*
U.S. Cl. 340—172.5 **2 Claims**



1. A pitch error compensation system for a machine tool provided with a pulse motor adapted to move a movable member through a feed screw and a pulse generator for producing a train of pulses to be applied to said pulse motor in accordance with numerical information, comprising:

memory means for storing said numerical information including control data to instruct incremental feed amounts of said movable member and compensating data used to compensate the positioning error of said movable member therein, said compensating data consisting of data pairs of compensating directions and compensating positions determined as positions where said positioning error changes in magnitude beyond a predetermined unit amount of positioning error;

presettable counter means for registering an incremental feed amount supplied from said memory means;

accumulating counter means for indicating an absolute position of said movable member in accordance with said incremental feed amount;

position detecting means responsive to said memory means for registering said compensating positions;

direction detecting means responsive to said memory means for registering said compensating directions;

comparator means for comparing contents in said accumulating counter means and said position detecting means to select compensating directions between the absolute position of said movable member and a predetermined origin; and

summing counter means responsive to said direction detecting means and said comparator means for detecting a positioning error for said incremental feed amount in accordance with the selected compensating directions, said presettable counter means being responsive to said summing counter means for modifying said registered incremental feed amount in accordance with said positioning error.

3,852,720
METHOD AND APPARATUS FOR AUTOMATICALLY GENERATING KOREAN CHARACTER FONTS

Hen Shu Park, 20707 Anza Ave. No. 10, Torrance, Calif. 90505

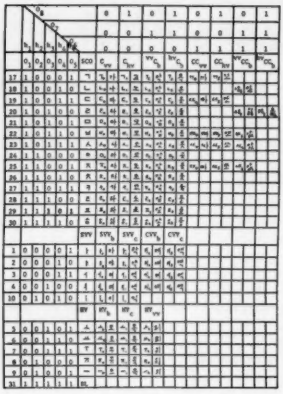
Filed Feb. 12, 1973, Ser. No. 332,013
Int. Cl. B41b *9/00;* **G06f** *3/12*
U.S. Cl. 340—172.5 **9 Claims**

1. A character converter for generating output signals indicative of a font for the basic symbols of a character from a set of coded input signals identifying each symbol comprising:

a. a plurality of four stage shift registers for storing successive identifying coded signals,

b. geometrical group classifying means connected to said plurality of shift registers for classifying said stored identifying signals into geometrical groups and for providing geometrical group output signals,

c. control circuit means connected to receive the group output signals from said geometrical group classifying means, said control circuit means providing compositional structure output signals associated with each identifying coded signal, and



d. output buffer means connected to receive said compositional structure output signals and said associated identifying coded signals,

said control circuit means comprising:

1. means for generating a first control signal for shifting the stored identifying coded signals in the second stages of the plurality of shift registers into said output buffer means, and

2. means for generating a second control signal for shifting the stored identifying coded signals in the third stages of said plurality of shift registers into said output buffer means.

3,852,721
TRACKING LIGHT PEN SYSTEM

Paul T. Tucker, Urbana, and William Coates, Champaign, both of Ill., assignors to University of Illinois Foundation, Champaign County, Ill.

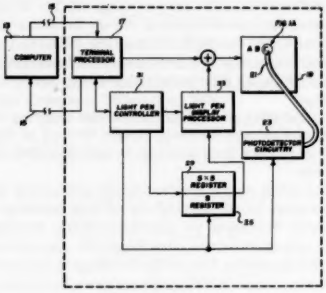
Filed May 14, 1973, Ser. No. 359,639
Int. Cl. G06f *3/14;* **G08b** *5/36*
U.S. Cl. 340—172.5 **16 Claims**

1. A method for tracking the movements of a light pen on a plasma display panel with a cursor, the plasma panel comprising an array of gaseous discharge cells for storing and visually displaying the information, the cursor comprising a sub-array of the gaseous discharge cells in the plasma display panel including an arrangement of the gaseous discharge cells which are aligned with the orthogonal axes of the cursor sub-array and located on opposite sides of the cursor, the method comprising:

sequentially interrogating the cursor cells;

monitoring the plasma display panel with the light pen for the sequential cursor cell interrogations to determine the direction in which the light pen is displaced relative to the cursor, the combination of sequential cursor cell interro-

gations monitored by the light pen being indicative of the direction in which the light pen is displaced relative to the cursor; and



electronically repositioning the cursor in the plasma display panel to be under the light pen and coincident therewith responsive to the determination of the direction of the displacement of the light pen from the cursor.

3,852,722
IMPROVED STATIC REMOTE-CONTROL RELAY SELECTION SYSTEM

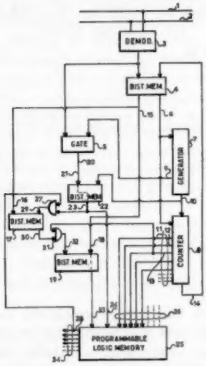
Claude Neuville, Paris, France, assignor to Compteurs Schlumberger, Montrouge, France

Filed June 28, 1973, Ser. No. 374,452

Claims priority, application France, June 30, 1972, 72.23730

Int. Cl. G06f *3/04*; **H01h** *47/00*; **H04q** *1/52*

U.S. Cl. 340—172.5 **1 Claim**



1. In a static remote-control relay which can be controlled by a pulse train including a starting pulse followed by a finite set of possible pulses transmitted at a given frequency, the starting pulse being separated from the first possible pulse of said finite set of possible pulses by a time differing from the time between two possible pulses of the said finite set of possible pulses, including:

means for receiving said finite possible pulse set;

a pulse generator responsive to the first starting pulse to start delivering, at an output thereof, pulses in phase with the pulses of the said finite possible pulse set;

a counter having a count input connected to said pulse generator for counting pulses generated thereby and a plurality or ordered outputs, the number of said ordered counter outputs being at least as large as the number of possible pulses from the finite set and each said counter output delivering a pulse when the pulse count stored in said counter corresponds to the order of the respective counter output; and

a programmable logic circuit having a plurality of inputs respectively connected to the ordered outputs of the said counter, at least one input connected to said pulse train receiving means and a plurality of useful outputs to selectively produce control signals on said useful outputs in response to pulse coincidence on said pulse train receiving means and a predetermined one of said counter outputs, the improvement which comprises a preselection circuit responsive to preselection pulses forming a first part of said finite set of possible pulses for inhibiting said programmable logic circuit when a predetermined preselection pulse is not detected in coincidence with a predetermined count pulse delivered by said counter, said preselection circuit comprising:

a first bistable circuit coupled to an output of said programmable logic circuit for memorizing the coincidence of a preselection pulse in said first part of the first set of pulses and of a predetermined count pulse,

means coupled to said first bistable circuit and to a predetermined one of said counter ordered outputs having an order higher than that corresponding to the end of said first part of the finite set of possible pulses for detecting the occurrence of a pulse at said predetermined counter output when no coincidence has been memorized by said first bistable circuit, and

a second bistable circuit coupled to said detecting means for switching in response to said detected occurrence into a state inhibiting said programmable logic circuit until the end of the finite pulse set.

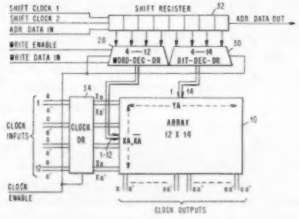
3,852,723
PROGRAMMABLE SIGNAL DISTRIBUTION SYSTEM

Wei-Wha Wu, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1973, Ser. No. 418,696

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **9 Claims**



1. A programmable signal distribution system comprising:

a plurality of inputs and a plurality of outputs;

an array of crosspoint switches connected between said inputs and said outputs;

a memory cell connected to each of said crosspoint switches;

means for writing a signal into each of said memory cells determinative of the condition of the respective crosspoint switch; and

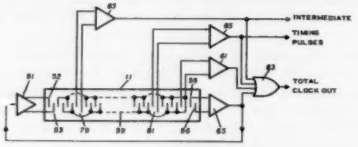
means for enabling the operation of each of said crosspoint switches to provide an output in accordance with said signal stored in said respective memory cell thereby connecting said respective inputs to said respective outputs.

3,852,724

SURFACE WAVE CLOCK AND SERIAL DATA STORAGE UNIT

Robert J. Schwartz, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 30, 1973, Ser. No. 346,517
Int. Cl. G11c *21/00*
U.S. Cl. 340—173 RC **8 Claims**



1. A digital, serial data storage unit formed on a common substrate comprising:

a. a surface wave clock circuit having a driver and driver electrodes and a receiver and receiver electrodes, and further including clock electrodes positioned between and electrically isolated from the driver and receiver electrodes, the spacing between each of the electrodes determining the propagation delay therebetween;

b. at least one surface wave device having a driver and driver electrodes, and a receiver and receiver electrodes, with a predetermined propagation delay between the driver and receiver electrodes;

c. means for applying an initial pulse to the surface wave clock;

d. clock transmission means connected to transmit a propagated clock pulse from the electrodes in the surface wave clock circuit; and

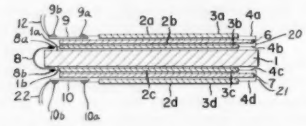
e. input means having first gate means for receiving the serial digital data and connected to the transmission means, to permit entry of the data when a clock pulse is present.

3,852,725

MAGNETIC PLATED WIRE MEMORY DEVICE

Isamu Ogura; Takaaki Miyashita, and Yoshimoto Aida, all of Tokyo, Japan, assignors to Oki Electric Industry Co. Ltd., Minato-ku, Tokyo, Japan

Filed May 21, 1973, Ser. No. 362,086
Int. Cl. G11c *11/04, 11/14, 5/06*
U.S. Cl. 340—174 BC **5 Claims**



1. A memory assembly comprising:

a rigid planar mounting board;

a first set of spaced parallel row windings positioned on one surface of said board;

a second set of spaced parallel row windings arranged on the opposite side of said board parallel to said first set;

a third set of spaced parallel row windings arranged immediately above and in spaced parallel fashion with said first set of row windings;

a fourth set of spaced parallel row windings arranged immediately below and adjacent the second set of row windings and being parallel thereto;

first and second magnetic keeper board means positioned between said first and third sets of row windings and said second and fourth sets of row windings respectively for minimizing mutual electro-magnetic coupling between said first and third and said second and fourth sets of row windings;

means included in each row winding set for electrically insulating the row windings of the set from one another;

first connecting means for connecting a first end of each of the row windings in the third set of row windings to an associated one of the row windings in the first set of row windings;

second connecting means for electrically coupling the opposite ends of said windings in said first set of said row windings to associated windings in said second set of row windings;

third connecting means for electrically connecting each of the windings in the second set of row windings to an associated winding in the fourth set of row windings;

first and second end connector means for electrically coupling the remaining ends of the windings in said third and fourth sets of row windings to peripheral circuitry;

first, second, third, and fourth sets of word windings, each set of word windings being comprised of a plurality of spaced parallel word lines; said first, second, third, and fourth sets of word windings being arranged in orthogonal fashion and being positioned immediately adjacent said first, second, third, and fourth sets of row windings respectively;

each of said sets of word windings further comprising x and Y selection means coupled to opposite ends of selected ones of said word lines for word selection purposes;

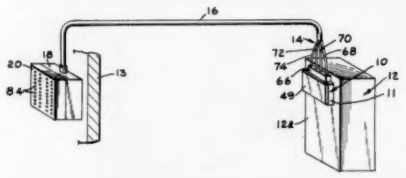
said keeper board means also minimizing electromagnetic coupling between said first and third sets of word windings and said second and fourth sets of word windings.

3,852,726

REMOTE METER MONITOR

Pat Romanelli, Harrington Park, N.J., assignor to Ram Domestic Products Company, Northvale, N.J.

Filed July 26, 1973, Ser. No. 383,300
Int. Cl. G08c *19/32*
U.S. Cl. 340—188 R **7 Claims**



1. Remote meter monitor apparatus for connection to a circular type meter with a rotatably driven pointer having a magnetic free end, comprising a circular array of spaced magnetic field sensitive elements in proximate concentric peripheral position with respect to the circular sweep of said magnetic free end of said pointer, whereby said magnetic field sensitive elements will be selectively actuated in accordance with the proximate position therewith of said magnetic free end of said pointer to produce a digital electrical signal representing the angular position of said pointer and the reading on said meter, a housing adaptable to be mounted over the dial face of said meter, said housing having a cylindrical chamber for enclosing said meter pointer and a circular array of bores therein surrounding said chamber for receiving and positioning said magnetic field sensitive elements in said concentric peripheral position and perpendicular to said dial face, remote terminal means located at a position remote from said meter, electrical transmission means interconnecting said magnetic field sensitive elements and said remote terminal means for transmitting said digital electrical signal to said remote termi-

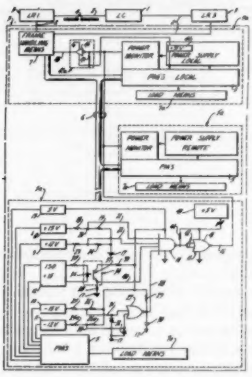
nal means, and digital readout means adaptable for connection to said remote terminal means and responsive to said digital electrical signals to provide a digital readout corresponding to the angular position of said pointer.

3,852,727

MULTIPLE VOLTAGE MONITORING APPARATUS

Manuel Frank Chacon, Mequon, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Dec. 15, 1972, Ser. No. 315,569
Int. Cl. G08b *23/00*
U.S. Cl. 340—213 R **13 Claims**



1. A multiple voltage monitoring apparatus for remote station connection in a loop communication system comprising a multiple input trigger means having a plurality of inputs, any one of said inputs being independently operable to trigger an output, a plurality of voltage power supply connection means, separate voltage monitoring means connected to each voltage supply connection means and providing a continuous monitoring of the corresponding voltage supply, means connecting each monitoring means to a separate input of the trigger means and each monitoring means being independently operable to actuate the trigger means in response to a selected deviation of the supply from a predetermined voltage, and an externally-powered buffer gate means having a separate power supply which is independent of other monitored power supplies and having an input connected to the output of the trigger means and establishing a voltage fault signal in response to any one of said deviations which actuates the trigger means and in response to a failure of its own power supply.

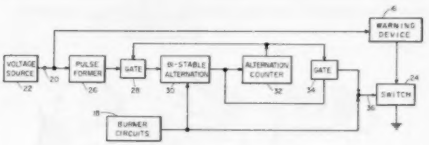
3,852,728

STOVE WARNING DEVICE

Willard A. Flagg, Jr., Topsfield, Mass., assignor to Ark-Les Switch Corporation, Watertown, Mass.

Filed Oct. 29, 1973, Ser. No. 410,809
Int. Cl. H05b *3/68*
U.S. Cl. 340—227 R **14 Claims**

1. Apparatus for operating a warning device for use with a stove having one or more electric burner circuits, comprising: an energizing circuit for said warning device, including a switch means governing the operation of said warning device, a first control circuit for said switch means, said control circuit having means to receive a signal indicating operation of at least one of the burner circuits, and means to set said switch means in a mode completing an energizing path for the warning device during receipt of said burner operation signal, and a second control circuit for said switch means, including bi-stable means alternatable in response to discontinued operation of said burner circuits between first and second states respectively setting and not setting the switch means in a mode



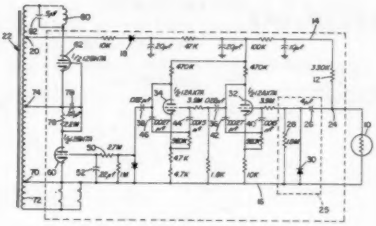
completing an energizing path for the warning device, means to alternate said bi-stable means, and means to terminate operation of said bi-stable means after a predetermined number of alternations.

3,852,729

FLAME FAILURE CONTROLS

Phillip J. Cade, Winchester, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed Mar. 6, 1973, Ser. No. 338,540
Int. Cl. G08b *17/12*; **F23r** *5/08*
U.S. Cl. 340—228.2 **12 Claims**



1. A condition responsive system comprising a radiation sensitive condition sensor for producing an output signal in response to the sensing of a condition to be detected,

an output device arranged to assume a first state indicative of the condition being sensed when said sensor senses said condition and a second state indicative of the absence of said condition to be sensed when said sensor does not sense said condition,

discriminator circuitry connecting said sensor and said output device for placing said output device in said first state in response to the production of a fluctuating output signal by said condition sensor, and

circuitry responsive to an abrupt decrease in the condition sensed by said sensor for placing said output device in said second state independent of fluctuations of the signal produced by said sensor.

3,852,730

EMISSION MONITORING SYSTEM

James A. Commins, 7708 Orchard Way, Philadelphia, Pa. 19118

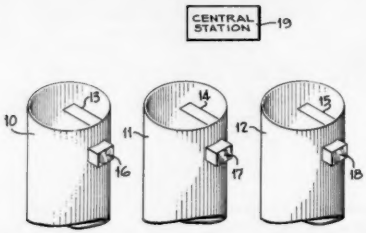
Filed Oct. 12, 1971, Ser. No. 188,197
Int. Cl. H04q *9/00*
U.S. Cl. 340—237 R **10 Claims**

1. A system for monitoring a predetermined parameter of the atmospheric emissions flowing through a stack from a source of such emissions, comprising:

means for measuring in said stack the values of several parameters of said emissions different from each other and also different from said predetermined parameter;

means for transmitting said measured values to a location remote from said source; and

means for processing said transmitted values at said remote location to derive therefrom the desired monitoring information represented by said predetermined parameter; said means for transmitting operating under the control of said remote location.



3,852,731

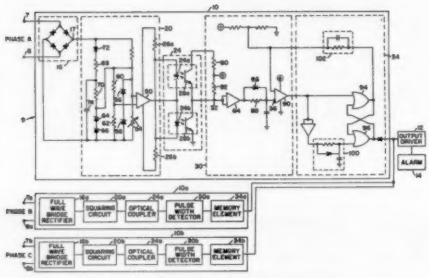
AC VOLTAGE SENSING APPARATUS

Daniel H. Hollands, Webster, N.Y., assignor to Rochester Instrument Systems, Inc., Rochester, N.Y.

Filed Oct. 12, 1973, Ser. No. 405,854

Int. Cl. G08b *21/00*

U.S. Cl. 340—248 B **2 Claims**



1. Apparatus for determining if an alternating voltage from an electrical source applied across a line is less than a reference voltage level, said apparatus comprising:

a. an actuable alarm, and

b. alarm actuating means coupled to said alternating voltage source and said alarm including:

i. means for producing a square wave pulse the width of which varies inversely as the function of the amplitude of said alternating voltage, and

ii. pulse width detector means responsive to the pulse width of said square wave being greater than a predetermined width for actuating said alarm.

3,852,732

SOLID STATE UNIVERSAL BATTERY MONITOR

Daniel S. Yorksie, Pittsburgh, Pa., and Brant Terzic, Chicago, Ill., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 346,532, March 30, 1973, abandoned. This application June 14, 1973, Ser. No. 370,079

Int. Cl. G08b *21/00*

U.S. Cl. 340—249 **8 Claims**

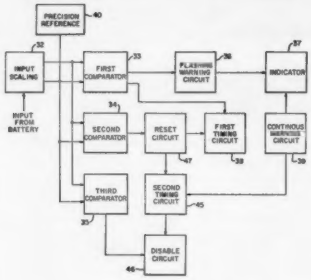
1. Apparatus for monitoring the output voltage of a battery used as an energy source for electrically powered equipment and for disabling a selected function of said equipment when the output voltage of said battery remains within preselected regions for a preselected time, comprising in combination:

a. first means for generating a first warning signal when the output voltage of said battery is below a first preselected value and for terminating said first warning signal when said battery voltage exceeds a second preselected value;

b. second means for terminating said first warning signal and initiating a second warning signal whenever said first warning signal has persisted for a period exceeding a first preset time period;

c. third means for terminating said second warning signal if the terminal voltage of said battery rises to a third preselected value within a second preselected time period; and

d. disable means for diabling a function of said electrically powered equipment if the terminal voltage of said battery does not rise to said second preselected value within said second preselected time period.



3,852,733

BREAKAGE DETECTOR FOR AUTOMOTIVE LAMP CIRCUITS

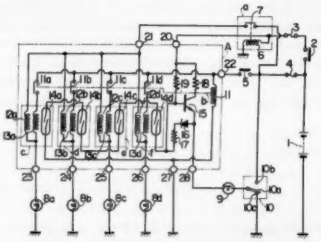
Yasuhiko Sakurai, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya-shi, Aichi-ken, Japan

Filed Oct. 4, 1973, Ser. No. 403,610

Claims priority, application Japan, Oct. 6, 1972, 47-100882

Int. Cl. H05b *37/03*

U.S. Cl. 340—251 **2 Claims**



1. A breakage detector for an automotive lamp circuit having a plurality of lamps, a key switch, a lamp switch, a relay switch means for turning on said lamps when said lamp switch is closed and a power supply, comprising:

a plurality of relays each including a current coil connected in series with an associated one of said lamps and said relay switch means, a voltage coil connected to said power supply as to be energized through said lamp when said key switch is closed, and a normally open switch adapted to be closed when either said current coil or said voltage coil is energized;

a series circuit made of said normally open switches of said individual relays connected in series;

a detecting means connected to said series circuit for detecting the state of said normally open switches of said relays; and

an indicating means connected to said detecting means and producing an alarm when any one of said normally open switches is open.

3,852,734

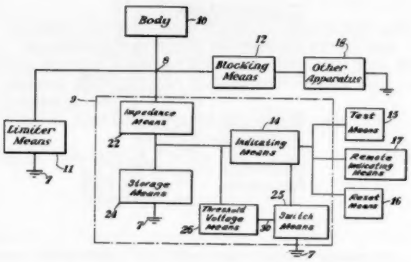
ANTENNA INSULATION FAILURE DETECTOR

Robert L. Truax, 116 Fifth St., Fort Meyers, Fla. 33931

Filed Sept. 28, 1972, Ser. No. 293,009

Int. Cl. G08b *21/00*

U.S. Cl. 340—253 R **18 Claims**



1. An apparatus for monitoring a direct current between a body normally electrically insulated from a reference point and said reference point, said apparatus comprising:

A. a terminal, insulated from a reference point, adapted to be connected to a body,

B. storage means, connected between said terminal and said reference point, for storing energy,

C. indicating means, connected to said storage means, for indicating the occurrence of direct current therethrough,

D. normally open switch means, connected to said indicating means and to said reference point, for connecting said indicating means to said reference point when the switch means is closed, the switch means having a control terminal for closing the switch means in response to a signal on said control terminal, and

E. threshold voltage means, connected to said control terminal and responsive to a potential on said storage means, for closing said normally open switch means by placing a signal on said control terminal when the potential on said storage means reaches a predetermined voltage.

3,852,735

ALARM APPARATUS UTILIZING HIGH FREQUENCY

Shigeo Matsuda, and Nasoshi Obara, both of Tokyo, Japan, assignors to Modern Electronic Instrument Corporation, Tokyo, Japan

Filed Mar. 2, 1972, Ser. No. 231,214

Claims priority, application Japan, Aug. 9, 1971, 46-71230

Int. Cl. G08b *13/26*

U.S. Cl. 340—258 C **7 Claims**

1. An alarm system utilizing electromagnetic waves for detecting a moving object, comprising, in combination:

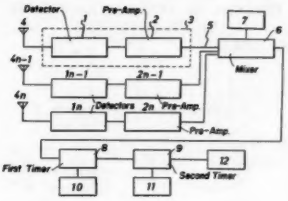
at least one antenna means;

at least one transmitter-receiver apparatus having an oscillation loop for detecting changes in the impedance of said antenna means;

an amplifier circuit is operatively connected to said transmitter-receiver apparatus for amplifying an output signal from said transmitter-receiving apparatus;

an alarm device operatively connected to said amplifier circuit is operated by the amplified signal so that an alarm is produced in response to said object moving in the range of space covered by the electromagnetic waves rediated radiated said antenna means; and

a first timing device and a second timing device disposed between said amplifier circuit and said alarm device, said



second timing device being operated when said first timing device is operated, and a charge-discharge circuit is disposed so that said second timing device stays in its operating state for a certain definite time even after said first timing device is changed over from its ON to OFF state.

3,852,736

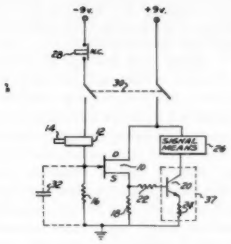
BED EGRESS ALARM CIRCUIT

Kenneth J. Cook, Oak Park, and Norman H. Korwitz, W. Bloomfield Hills, both of Mich., assignors to William Beaumont Hospital, Royal Oak, Mich.

Filed Mar. 5, 1973, Ser. No. 337,955

Int. Cl. G08b *21/00*

U.S. Cl. 340—279 **10 Claims**



1. A condition responsive circuit for signalling the departure of a patient from a bed or the like by generating an output signal upon the opening of a switch, comprising:

a switch being normally closed by the weight of a patient in a bed;

an FET having source, drain and gate electrodes, said gate electrode connected to said switch for normally drawing only a nominal current and for continuously biasing said gate electrode to render said FET non-conductive;

a normally off output means coupled to said at least one of source and drain electrodes for generating an output signal when said FET is rendered conductive;

the opening of said switch to remove the continuous bias from said gate electrode;

delay means coupled to said switch and said gate electrode for maintaining a bias at said gate electrode to prevent said FET from being rendered conductive for a predetermined time interval after the opening of said switch; and said output means including an SCR, an SCR switch, and a signal means, all connected in series;

said SCR being rendered conductive by said FET being

rendered conductive to thereby generate an output signal from said signal means, and said SCR being thereafter rendered non-conductive only by operating said SCR switch.

3,852,737

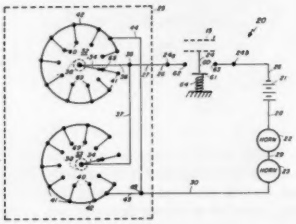
PRODUCT VENDING MACHINE ALARM

Claude E. Gordon, 4521 Blonigen Ave., Orlando, Fla. 32806

Filed Oct. 12, 1973, Ser. No. 405,932

Int. Cl. G08b *13/08*

U.S. Cl. 340—274 R **2 Claims**



1. In a product vending machine having an internal compartment with an external wall, an exterior door closing an entranceway to said compartment and being movable to an open position, and a signaling device for signaling an unauthorized opening of said door, the improvement where said device includes an alarm circuit comprising an open switch component which closes in response to opening movement of the door and has a pair of terminals, circuit components for establishing an electrically conductive circuit connection between said terminals including a DC battery, sound producing means connected in series with the battery and energizable by completion of the alarm circuit to sound an audible alarm, and a mechanism for arming and disarming said alarm circuit, said device including a housing for said mechanism which is located in said compartment and mounted on said wall, and a housing for said DC battery and said sound producing means which is restingly located within said compartment and randomly locatable therein, said mechanism comprising a switching component connected in series with said battery and said sound producing means and being manipulatable to make and break said conductive circuit connection, said switching component having an element that is rotatably manipulatable about an axis to selectable positions which include a plurality of positions at each of which said circuit connection is complete, and a position at which said circuit connection is broken, said element being manipulatable at the exterior of the housing for said mechanism and inwardly offset from the exterior surface of the wall, said element being arranged with its axis normal to the exterior wall surface and having an end with a recess shaped to receive the working end of a tool for use in the rotative manipulation thereof, and said wall having an opening which is arranged in working alignment with the end of said element and arranged to receive the working end of the tool.

3,852,738

RIPPLE-CONTROL RECEIVER RESPONSIVE TO MULTIPLE COMMAND CONTROL

Felix Niederberger, Zug, and Christian Schweizer, Steinhausen, both of Switzerland, assignors to Landis & Gyr AG, Zug, Switzerland

Filed July 24, 1972, Ser. No. 274,223

Claims priority, application Switzerland, June 26, 1971, 11014/71

Int. Cl. H04q *5/00*

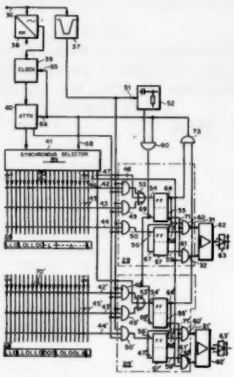
U.S. Cl. 340—310 **14 Claims**

1. A ripple control receiver responsive to a transmitted program containing a start command, control commands and a confirmation command including:

a. receiver means for receiving said transmitted start command, control commands and confirmation command;

b. program storage means wherein are stored a start command, control commands and a confirmation command;

c. comparator means operably connected to said receiver means and said program storage means and responsive thereto for comparing said transmitted and stored start



commands, control commands and confirmation commands; and

d. execute means operably connected to the output of said comparator means and responsive thereto for executing the commanded control operation upon a favorable comparison of said transmitted and stored start, control and confirmation commands.

3,852,739

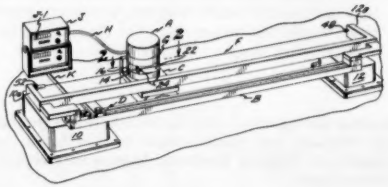
MOVEMENT DETECTING AND VISUAL INDICATING DEVICE

Henry G. Mohr, III, 1418 N. Center St., Orange, Calif. 92667

Filed June 29, 1973, Ser. No. 375,114

Int. Cl. H03k *13/00*; **G01b** *3/00*

U.S. Cl. 340—347 AD **9 Claims**



1. In combination with a machine having a movable element that traverses a straight path between first and second upwardly extending portions of said machine, a device for indicating the the extent of movement of said element in traversing said path, said device including:

a. an elongate resilient member having first and second ends;

b. first tensioned spring means that secure said first end to said first upwardly extending portion;

c. second means for securing said second end to said second upwardly extending portion, with said first and second means cooperatively holding said resilient member in a tensioned condition parallel to said path;

d. a cylindrical drum rotatably supported relative to said element, with said drum having a plurality of wraps of said resilient member extending therearound;

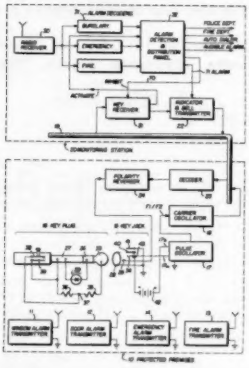
e. third means for maintaining a centrally disposed one of said wraps in a non-movable position relative to said drum which third means includes a tapped bore which extends into said drum to communicate with a passage that extends through said drum and in which passage a section of a center wrap of said resilient member is disposed, and a set screw in engagement with said tapped bore, which set screw when tightened frictionally engages said section of said center wrap to prevent said center wrap from moving relative to said drum.

3,852,740

ALARM SYSTEM WITH RADIO ALARM LINK AND EQUIPMENT-ACTIVATING POWER LINE LINK

Irving Haymes, Tamarac, Fla., assignor to Earl Yale Fine; Kenneth Borzage; Soley Goldberg and Steven Fine, part interest to each

Filed Apr. 16, 1973, Ser. No. 351,164
Int. Cl. G08b *25/00*
U.S. Cl. 340—416 **20 Claims**



1. In an alarm system having:

a monitoring station with alarm monitoring equipment;

a protected premises which is interconnected with the monitoring station through electrical power lines;

a radio link comprising one or more radio transmitters at the protected premises for transmitting an intrusion alarm signal when an intrusion alarm condition is detected there, and a radio receiver at the monitoring station for receiving said radio alarm signals and operatively coupled to said alarm monitoring equipment to actuate the latter when a radio alarm signal is received;

and a power line link comprising means selectively operable at the protected premises for transmitting over power lines to the monitoring station signals for activating the alarm monitoring equipment there to respond to intrusion alarm signals broadcast from the protected premises;

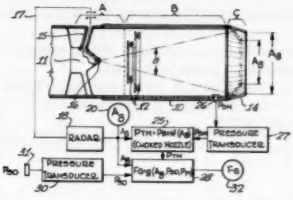
the improvement wherein said power line link further comprises means at the monitoring station for transmitting over power lines to the protected premises signal information as to whether the alarm monitoring equipment there is activated to respond to intrusion alarm signals broadcast from said protected premises.

3,852,741

NOZZLE AREA MEASUREMENT

George B. McDonald, Ottawa, Canada, assignor to Control Data Canada, Ltd., Willowdale, Ontario, Canada

Filed June 11, 1973, Ser. No. 368,810
Int. Cl. G01s *9/02;* **G01l** *5/14*
U.S. Cl. 343—5 R **8 Claims**



1. Apparatus for determining the area of an opening defined by components of a jet engine, comprising

a radiation source mounted within said engine for directing electromagnetic radiation towards said opening to impinge on said components defining said opening and to pass through said opening,

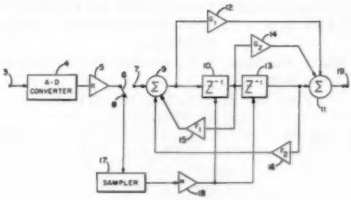
a radiation detector mounted within said engine for receiving radiation reflected from said components defining said opening, and for providing an output signal related to the intensity of the received reflected radiation representing the area of the opening.

3,852,742

DIGITAL MTI CANCELLER APPARATUS USING INITIALIZATION

Robert H. Fletcher, Jr., and Donald W. Burlage, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 8, 1973, Ser. No. 322,045
Int. Cl. G01s *9/42*
U.S. Cl. 343—7.7 **8 Claims**



1. A digital MTI canceller having means for converting analog radar echos into digital signals; first and second shift register storage means each having a signal input, an output, and a preset input; first and second summers each having inputs and an output; plural multipliers each having an input and an output; means connecting said output of said means for converting to an input of said first summer; wherein said output of said first summer is connected to said signal input of said first storage means and to the input of a first one of said multipliers, said output of said first storage means is connected to respective inputs of second and third multipliers and to said signal input of said second storage means, said output of said second storage means is connected to the input of a fourth multiplier and to an input of said second summer, the outputs of said first and second multipliers are connected to respective inputs of said second summer, and the outputs of said third and fourth multipliers are connected to respective

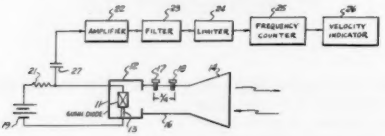
inputs of said first summer, the improvement comprising: initialization means having an input and an output, with said input connected to said means connecting; and additional means for connecting said output of said initialization means to said preset inputs of said storage means; wherein said output of said second summer is the output of the canceller.

3,852,743

HOMODYNE DOPPLER RADAR WITH INCREASED TARGET SENSITIVITY

Radha Raman Gupta, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sept. 18, 1970, Ser. No. 73,281
Int. Cl. G01s 9/44
U.S. Cl. 343—8 **13 Claims**



1. A homodyne doppler radar system having increased target detection sensitivity comprising:

an oscillation generating and frequency converting means for generating a transmitted signal and mixing said transmitted signal with a received signal to produce a converted frequency;

a transmitting-receiving antenna for transmitting said transmitted signal and receiving said received signal;

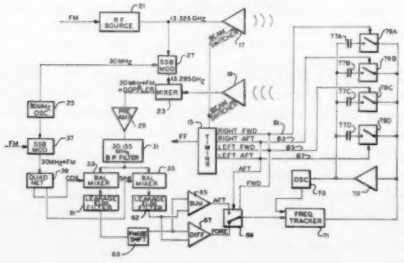
variable discontinuity means interposed between said generating and mixing means and said antenna, said discontinuity serving to maximize the power level of said converted frequency to thereby increase the sensitivity of said radar system.

3,852,744

SINGLE TIME SHARED RECEIVER AND FREQUENCY TRACKER FOR A BEAM-LOBED DOPPLER RADAR SYSTEM

Robert Slater, Bardonia, N.Y., assignor to The Singer Company, Little Falls, N.J.

Filed Jan. 5, 1973, Ser. No. 321,439
Int. Cl. G01s 9/46
U.S. Cl. 343—9 **9 Claims**



1. In a Doppler navigation system comprising at least a microwave transmitter, and a signal to frequency modulate the transmitter, a transmitting antenna coupled to the transmitter to simultaneously transmit at least a pair of fore and aft beams, a receiving antenna to receive the reflected beam signals containing respective fore and aft doppler return signals, and a receiver front end including means having the received signal as an input to provide from the received beam signal a signal at a lower intermediate frequency, means to separate the first and second doppler return signals obtained comprising:

a. an oscillator operating at the intermediate frequency;

b. a single sideband modulator having the output of said oscillator and the frequency modulating signal as input and providing a single sideband output;

c. a quad network having the output of said modulator as an input and providing first and second outputs at said frequency but shifted in phase 90° from each other;

d. a first mixer having the output of the receiver front end and said first quad output as inputs;

e. means to shift the output of said first mixer 90°;

f. a second mixer having the output of the receiver front end and said second quad outputs as inputs;

g. a summing amplifier having as inputs the outputs of said second mixer and said phase shifter; and

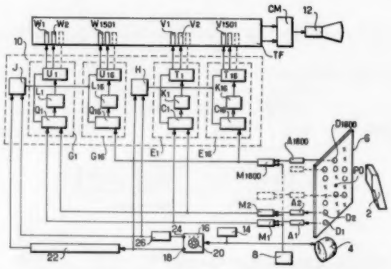
h. a difference amplifier having as inputs the outputs of said second mixer and said phase shifter whereby the output of said summing amplifier will be the fore doppler return signal and the output of said difference amplifier the aft doppler return signal.

3,852,745

MULTIPLE SONDE OF THE FOURIER TRANSFORMATION TYPE

Patrick Lebail, Neuilly-sur-Seine, France, assignor to Compagnie Industrielle Des Telecommunications Cit Alcatel, Paris, France

Filed Apr. 30, 1973, Ser. No. 355,684
Claims priority, application France, Apr. 28, 1972, 72.15414
Int. Cl. G01s 7/04
U.S. Cl. 343—17 **9 Claims**



1. Multiple Fourier transformation sonde comprising a source of undulatory radiation irradiating the object to be sounded, a matrix of detectors receiving said radiation sent back by said object, the positions of said detectors being defined on said matrix by their rectilinear coordinates, each of said detectors supplying at its output a periodic reception signal representative in amplitude and in phase of the radiation it receives, sampling assembly means for receiving the reception signal of each of said detectors and for supplying at least one value of that sampled signal at a sampling instant, said sampled values of the reception signals being a function of the coordinates of the corresponding detectors, Fourier transformation calculator means for effecting a Fourier transformation of the said receiving function thus recorded in such a way that it supplies at the output a transformed function constituting a representation of the object to be sounded, said transformation calculator means including at least one sample memory means for recording said sampled values, said sampling assembly comprising means for supplying at least one

sampled value of a first type and one sampled value of a second type, of the reception signal supplied by each of the said detectors, means for sampling said values of said first and second types at two sampling instants separated by an interval of time substantially equal to an odd number of quarters of the period of said reception signal, said calculator means further including means for processing said sampled values of said first and second type according to the coordinates of the corresponding detectors to effect a complex Fourier transformation based on a complex receiving function which is defined for each group of coordinates corresponding to a detector by its true part equal to the said sampled value of the first type and by its imaginary part equal to the said sampled value of the second type, the modulus of the function obtained by the said complex Fourier transformation constituting said representation of the object to be sounded.

3,852,746

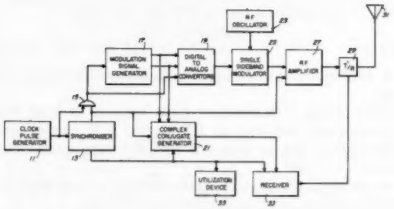
PULSE COMPRESSION RADAR

Oscar Lowenschuss, Goleta, Calif., and Rob Roy, Elnora, N.Y., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 14, 1972, Ser. No. 306,499

Int. Cl. G01s *9/233*

U.S. Cl. 343—17.2 PC **3 Claims**



1. A modulation signal generator in the transmitter of a pulse compression radar, such generator being responsive to a set of N clock pulses at the Nyquist rate, where "N" equals 3.2^x and "x" is a positive integer greater than "1," to produce a set of "N" complex digital numbers descriptive of a desired modulation signal and comprising:

a. a read only memory having stored therein a set of digital members representing the possible absolute values of the in phase and quadrature components of the complex digital numbers to be produced;

b. selection means, responsive to each successive one of a set of "N" clock pulses, for selecting "N" pairs of digital numbers in the read only memory corresponding to the absolute values of the in phase and quadrature components of successive ones of the complex digital numbers to be produced and for generating a digital representation of the sign of each one of such components; and

c. a pair of digital multipliers for combining the selected in phase and quadrature components with a digital representation of sign to produce, at the Nyquist rate, the set of "N" complex digital numbers.

3,852,747

DEVICE FOR NEUTRALIZING A FIRE-CONTROL RADAR

Jean Francois Morand, Paris, France, assignor to Electronique Marcel Dassault, Paris, France

Filed Sept. 14, 1972, Ser. No. 289,135

Claims priority, application France, Sept. 24, 1971, 71.34375

Int. Cl. H04k *3/00*; **G01s** *7/42*

U.S. Cl. 343—18 E **13 Claims**

1. A radar jamming device for jamming fire control radar searching for a target comprising:

means for receiving radar signals from a fire control radar,

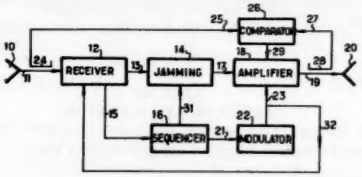
noise generating means,

means for initiating said noise generating means upon receipt of said radar signals from said fire control radar,

means for transmitting said noise signals from said noise generating means,

means for comparing the amplitude of said transmitted noise signals with said received radar signals,

first means for controlling the amplitude of said transmitted noise signals in response to said comparing means for



providing transmitted noise signals of approximately the same amplitude of said received radar signals,

second means for controlling the amplitude of said transmitted noise signals for producing pulse signals having an amplitude larger than said transmitted noise signals, said pulse signals superimposed on said noise signals, and

means for controlling the sequence of said pulse signals to produce false echoes at said fire control radar,

whereby said false echoes produce a rapid variation in the telemetric target distance and prevent radar tracking.

3,852,748

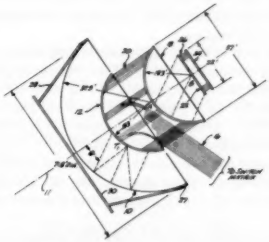
HIGH-RESOLUTION HEMISPHERICAL REFLECTOR ANTENNA

Louis Stark, Fullerton, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 2, 1966, Ser. No. 533,123

Int. Cl. H04b *7/00*

U.S. Cl. 343—100 AM **8 Claims**



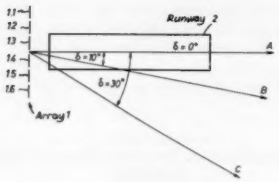
1. A lens antenna adapted to operate over a wide range of frequencies, said antenna comprising a first spherical conductive shell subtending a predetermined solid angle having a first center of curvature, the radius of said first shell being large compared to a wavelength at the lowest frequency in said wide range of frequencies; a second spherical conductive shell having said first center of curvature and subtending a solid angle that is at least coextensive with said predetermined solid angle, the radius of said second shell being no more than one-half the radius of said first shell; a third spherical conductive shell having a second center of curvature spaced from said first center of curvature and a radius of curvature equal to the radius of curvature of said second shell; means including a

plurality of antenna elements disposed over the convex side of said second shell for directing an electromagnetic wave of predetermined polarization towards the inner surface of said first shell from a predetermined location on said second shell and for receiving energy reflected from said first shell of a polarization orthogonal to said predetermined polarization at locations corresponding to each antenna element of said plurality thereof on said second shell; a corresponding plurality of antenna elements disposed in corresponding positions on the concave side of said third shell; and means connecting respective antenna elements on said second shell to corresponding antenna elements on said third shell for transmitting said reflected energy thereto over paths of equal electrical length.

3,852,749
RADIOLOCATION SYSTEM

Karl Kohler, Heimerdingen, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 24, 1973, Ser. No. 326,513
Claims priority, application Germany, Jan. 25, 1972, 2203442
Int. Cl. G01s *1/08*
U.S. Cl. 343—102 R **9 Claims**



1. In a radio navigation system for determining at least one angle in a plane of a remote receiving station with respect to a reference angle in said plane established at a ground station, said ground station including a linear array antenna having a plurality of elements energized cyclically and sequentially from a transmitter through a commutator arrangement to transmit RF oscillations from said elements sequentially, the combination comprising:

first means within said remote receiving station responsive to said ground transmitted RF oscillation pulses for measuring the phase and amplitude of said RF oscillations discretely for each pulse received from each of said elements of said ground station antenna with respect to a predetermined one of said elements;

second means for vectorially adding said measured phases and amplitudes and for determining the absolute value of the sum thereof over a cycle of said commutator arrangement;

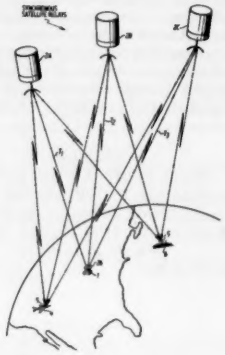
third means associated with said first means for modifying the phase of the RF oscillations of each received pulse corresponding to the transmitting time of one of said commutated elements by a predetermined phase angle offset value multiplied by the ordinal number of the corresponding element commutated at the time, said phase offset value being varied for each of a predetermined number of commutation cycles of said ground antenna array, said second means thereby producing a corresponding plurality of said absolute values each corresponding to a cycle of said commutation;

and fourth means responsive to said plurality of absolute values to determine the point of inflection in the series of them and the value of said offset angle corresponding thereto, said corresponding offset angle value being indicative of said angle in a plane.

3,852,750
NAVIGATION SATELLITE SYSTEM

Perry Ian Klein, Washington, D.C., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Oct. 16, 1972, Ser. No. 298,138
Int. Cl. G01s *1/30*
U.S. Cl. 343—105 R **11 Claims**



1. A method of determining the position of an object comprising:

a. transmitting in succession from each of at least three synchronous satellites an RF carrier, said carrier being modulated with at least one very low frequency (VLF) tone;

b. receiving said successive transmissions at said object;

c. demodulating said successive transmissions;

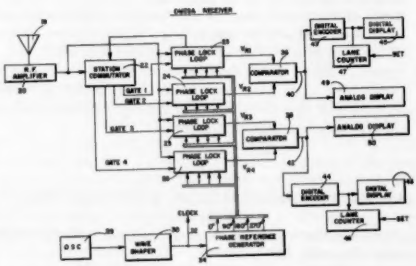
d. measuring the phase difference between tones of the same frequency transmitted from different ones of said satellites;

e. using two or more of said measured phase differences to determine the location of said object.

3,852,751
DATA HANDLING RECEIVER AND PHASE TRACKING

Robert L. Wood, South Gate, and Lyle R. Frederickson, Placentia, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 21, 1972, Ser. No. 317,440
Int. Cl. G01s *1/36*
U.S. Cl. 343—105 R **21 Claims**



1. A navigation receiver for use with a group of mutually spaced stations that transmit station signals in sequence from one station after another, each sequence of station signal transmissions being repetitive at a group repetition rate, said receiver comprising

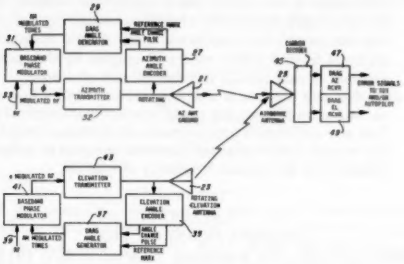
means for receiving said station signals,
a commutator comprising a recycling multi-stage shift register,
means for synchronizing the commutator with the sequence of signal transmissions from said group of stations,
first and second phase reproducing means each responsive to an input signal thereto of relatively short duration for generating a continuous output signal having a fixed phase relative to the phase of the input signal thereto,
means for feeding said received station signals as individual input signals to respective ones of said first and second phase reproducing means,
means responsive to said shift register for selectively activating individual ones of said phase reproducing means in synchronism with sequence of signal transmissions for selected ones of said stations,
comparator means for comparing output signals of said first and second phase reproducing means, and
means responsive to said comparator means for indicating phase difference of said selected received station signals.

3,852,752

DIFFERENTIAL AMPLITUDE ANGLE GUIDANCE

James B. Couvillon, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1972, Ser. No. 318,077
Int. Cl. G01s *1/14*
U.S. Cl. 343—108 M **6 Claims**



1. An instrument landing system operable with a scanning beam antenna system for providing glideslope and runway centerline indications to an aircraft comprising:

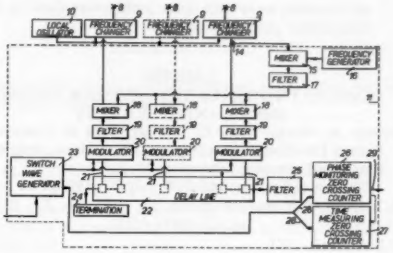
a. an azimuth antenna rotating in a plane parallel to the earth's surface;
b. an elevation antenna rotating in a plane normal to the earth's surface;
c. first means for generating a first pair of AM modulated tones representing the instantaneous position of said aximuth antenna, said tones having substantially equal amplitudes when the antenna is aligned with the runway;
d. second means for generating a second pair of AM modulated tones representing the instantaneous position of said elevation antenna, said tones having substantially equal amplitudes when the antenna is aligned with the correct glideslope;
e. azimuth transmitter means coupled to the azimuth antenna for generating a first carrier signal having a predetermined frequency, and elevation transmitter means coupled to the elevation antenna for generating a second carrier signal having a second predetermined frequency;
f. means for FM modulating said first carrier signal with said first pair of tones and said second carrier signal with said second pair of tones;
g. airborne means for receiving said first and second carrier signals;
h. means for detecting when said first and second carrier signals are illuminating the position in space occupied by said aircraft; and
i. means for detecting said two pairs of tones ane comparing their relative amplitude, wherein equal amplitudes indicate proper glideslope and/or centerline of runway.

3,852,753

POSITION LOCATING ARRANGEMENTS

Thomas Raymond Blakemore, Chelmsford, England, assignor to The Marconi Company, Limited, Chelmsford, Essex, England

Filed Oct. 6, 1972, Ser. No. 295,712
Claims priority, application Great Britain, Oct. 8, 1971, 46994/71
Int. Cl. G01s *5/02*
U.S. Cl. 343—113 R **5 Claims**



1. A direction finding arrangement for determining the bearing of a point from which radio frequency electromagnetic radiation is received, comprising:

an array of aerial elements for receiving said radiation;
modulator means for simultaneously gating for a predetermined period of time signals derived from the respective aerial elements;
delay means for delaying the gated signals by different amounts to arrange the gated signals sequentially in time whereby to produce an information signal having a frequency representative of the bearing of said point; and
means for determining the frequency of said information signal;
said signals derived from each aerial being produced by heterodyning the signals received by each aerial with signals produced by a local oscillator, additively mixing the heterodyned signals received by one aerial with a reference frequency, and subtractively mixing the resultant signal with the heterodyned signals received by each of aerials.

3,852,754

BINARY BEAM SYSTEM

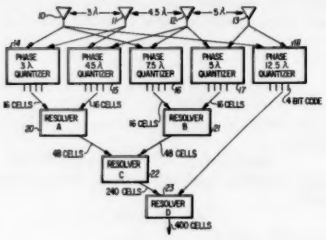
Edsel A. Worrell, Bethesda, Md., assignor to Litton Systems, Inc., College Park, Md.

Filed Sept. 21, 1971, Ser. No. 182,461
Int. Cl. G01s *5/02*
U.S. Cl. 343—113 R **11 Claims**

1. A digital direction finding system comprising:

an array including a first pair of antennas spaced apart at a distance that is a greater multiple than ½ of the wavelength of the signal to be detected,
said array including antenna means providing a second pair of antennas having a spacing greater than the first pair,
first and second phase comparator means for determining the time phase displacement of signals from each pair and providing first and second signals proportional to such phase displacements,

and a resolver energized by said first and second signals for producing a unique digital code defining the direction of



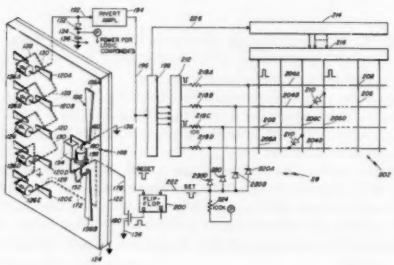
an incoming wave with fewer ambiguities than the signal from either phase comparator.

3,852,755

REMOTELY POWERED TRANSPONDER HAVING A DIPOLE ANTENNA ARRAY

George A. Works; John C. Murray, both of Hudson, and Nathan Freedman, West Newton, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 165,219, July 22, 1971, Pat. No. 3,745,569. This application Feb. 12, 1973, Ser. No. 331,920
Int. Cl. H01q *21/12*
U.S. Cl. 343—701 **7 Claims**



1. In combination:

a reflector;

an array of radiating elements each of which comprises a dipole type structure positioned in front of and spaced apart from said reflector; a plurality of serially connected diodes, each of said diodes being couple to respective ones of said radiating elements at the midpoints thereof; means interposed between said array and said reflector for positioning said radiating elements a uniform distance in front of said reflector such that an electric field provided by the radiating elements of said array in response to radiation incident upon said array and said reflector induces a voltage across said diodes.

3,852,756

ELECTRICALLY SMALL RESONANT ANTENNA WITH CAPACITIVELY COUPLED LOAD

Joe Reese, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

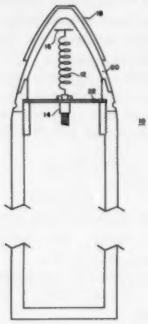
Filed Feb. 15, 1974, Ser. No. 442,933
Int. Cl. H01q *1/36*
U.S. Cl. 343—708 **10 Claims**

1. A physically small resonant antenna designed for utilization in applications having a relatively small volume in which to position an antenna for the wavelength to be transmitted or received, comprising:

an electrically conductive helical member having first and second opposite ends;

means for reducing the capacitive reactance of said antenna, including first and second electrically conductive members wherein said members are physically spaced apart and the first member is coupled near the first end of said helical member;

circuit means for processing an electrical signal, having at least first and second terminals;



a coaxial member having a plurality of electrically conductive elements wherein the first element couples said circuit means to the second end of said helical member; and an electrically conductive enclosure containing said circuit means and said coaxial member, wherein the second terminal of said circuit means is coupled by the second element of said coaxial member to said enclosure;

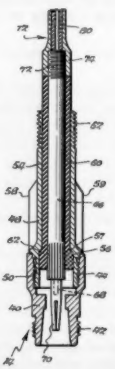
such that said antenna is a dipole antenna having first and second arms wherein the apparent electrical length of the first arm sufficiently approximates the electrical length of the second arm so that said antenna operates as a dipole antenna for the chosen frequency of interest.

3,852,757

ANTENNA CONSTRUCTION

Robert G. Kaiser, 394 Woodstock, Tonawanda, N.Y. 14150

Filed Apr. 26, 1973, Ser. No. 354,474
Int. Cl. H01q *1/10, 1/32*
U.S. Cl. 343—713 **16 Claims**



1. A mounting arrangement for a land vehicle antenna providing both standard radio reception and two-way radio

operation, said antenna including a mast portion extending from the body of the vehicle and having the appearance of a standard vehicle radio antenna and an antenna connector portion extending from said mast portion and to which electrical connection is made, said mounting arrangement comprising:

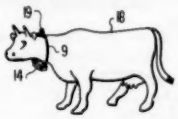
a. a generally hollow mounting element having a connector portion of electrically conducting material and adapted to be secured to the body of a vehicle and having a supporting portion extending from the vehicle body;
b. said antenna connector portion having one end adjacent said connector portion of said mounting element and a part thereof in said supporting portion;
c. insulator means fixed in said supporting portion of said mounting element and firmly contacting said antenna connector portion, said antenna connector portion being fixed in said insulator means; and
d. means releasably connecting said antenna mast portion to said antenna connector portion whereby said mast portion can be removed from said mounting arrangement.

3,852,758

COUPLING METHOD AND DEVICE FOR ANIMAL MOUNTABLE ELECTRONIC PACKAGE

Jerry H. Polson, 7823 Greenbriar Cir., Denver County, Colo. 80301

Filed Mar. 12, 1973, Ser. No. 340,567
Int. Cl. H01q *1/44*
U.S. Cl. 343—718 **3 Claims**



1. An animal mountable device having low vulnerability to breakage, said device comprising: a tube; a conductor extending through said tube and being freely movable relative thereto; a magnetic core fastened around said tube; a coil fastened to a portion of said magnetic core to establish coupling capability between said coil and said conductor, said coil being connected with predetermined electronic circuitry; and means to fasten the ends of said conductor together to form a loop antenna about a predetermined portion of an animal, said conductor supporting said tube having said core fastened thereto so that said tube is freely movable along said conductor without adversely affecting signal coupling between said conductor and coil.

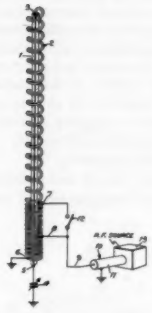
3,852,759

BROADBAND TUNABLE ANTENNA

Robert A. Felsenheld, 4 Cliffside Dr., Livingston, N.J., and Copthorne MacDonald, 81 Windsor Cir., Elmira, N.Y., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Apr. 1, 1960, Ser. No. 19,248
Int. Cl. H01q *1/36*
U.S. Cl. 343—729 **13 Claims**

1. A broadband tunable antenna comprising a first radiating element resonant at a first band of frequencies, a second radiating element resonant at a second band of frequencies disposed parallel to and coextensive with said first radiating element, means coupling one end of said first radiating element to one end of said second radiating element and adjustable capacitive tuning means connected to the other end of said second radiating element.

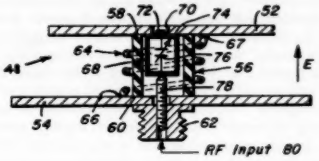


3,852,760

ELECTRICALLY SMALL DIPOLAR ANTENNA UTILIZING TUNED LC MEMBERS

Frank Reggia, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 7, 1973, Ser. No. 386,486
Int. Cl. H01q *9/28*
U.S. Cl. 343—747 **5 Claims**



1. A miniaturized dipolar antenna comprising:
first and second capacitor plates disposed in coaxial parallel spaced relation;
a, helically wound inductor coil positioned between the plates in coaxial relation thereto for electrical connection therewith to form a tuned LC resonant circuit;
adjustably positioned ferrite core coaxially disposed inwardly of the coil for tuning the operating frequency of the antenna; and
means connected to the inductor and the capacitor plates for introducing an r.f. signal to the antenna which energizes the inductor and the capacitor plates causing radiation of energy into a far field from the capacitor plates.

3,852,761

LENS FED ANTENNA ARRAY SYSTEM

Bruce Fredric Bogner, Mt. Holly, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,421
Int. Cl. H01q *3/26*
U.S. Cl. 343—754 **10 Claims**

1. An antenna array system comprising:
an enclosed transmission line including a pair of parallel conductive plates spaced from each other with a dielec-

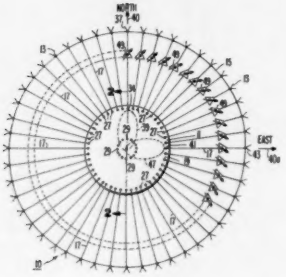
tric medium therebetween and a conductive ring-like band about the periphery thereof,

a first plurality of probes spaced in a ring-like pattern coaxial with the conductive band and that extends near the periphery of the enclosed transmission line, each of said first plurality of probes extending through one of said plates in a coupling manner with said transmission line,

a second plurality of probes being arranged in a pattern clustered near the center of the enclosed transmission line, said second plurality of probes extending through one of said plates in a coupling manner to said transmission line formed between said plates,

a plurality of radiating elements,

means coupling each one of said radiating elements to a selected one of said first plurality of probes,



means coupled to said second plurality of probes for exciting said second plurality of probes in a manner to produce a given electromagnetic wave energy distribution within said transmission line with maximum power emanating from the center of said enclosed transmission line in only selected radial directions in a plane substantially parallel to said plates, said first plurality of probes being disposed in a radial direction from said second plurality of probes a distance to cause only selected probes of said first plurality of probes to be appreciably excited in response to said given electromagnetic wave energy distribution and thereby produce a given radiated pattern from said radiating elements and means for changing said given electromagnetic wave energy distribution to control the radiated pattern from said radiating elements.

3,852,762

SCANNING LENS ANTENNA

George Henf, Pleasantville, and Leonard Schwartz, Scarsdale, both of N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 14, 1973, Ser. No. 415,634
Int. Cl. H01q *19/12, 19/08*
U.S. Cl. 343—756 **13 Claims**

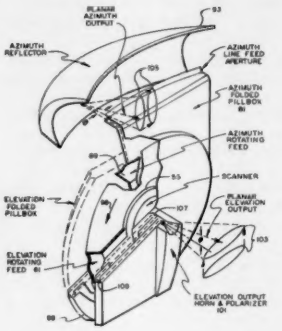
1. A scanning lens microwave antenna comprising:

a. a fixed circular reflector;

b. a scanner comprising an annular shaped rectangular waveguide split in half with the inner half containing a fixed inlet port and forming a stator and the outer half containing a plurality of rotatable outlet ports and forming the rotor and means in said waveguide to cause only one output at a time to couple to said input;

c. a parallel plate waveguide directing energy from said scanner to said reflector whereby said scanner will scan energy across said reflector; and

d. a parallel plate dielectric lens located at the end of said parallel plate waveguide, said dielectric lens mounted within a thin metal outer casing which is coupled to said



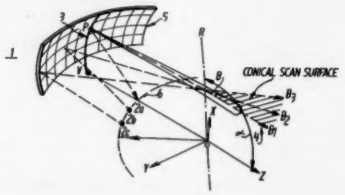
waveguide and having a tapered matching section extending into said waveguide.

3,852,763

TORUS-TYPE ANTENNA HAVING A CONICAL SCAN CAPABILITY

Randall William Kreutel, Jr., and Geoffrey Hyde, both of Rockville, Md., assignors to Communications Satellite Corporation, Washington, D.C.

Continuation-in-part of Ser. No. 44,450, June 8, 1970, abandoned. This application Dec. 4, 1972, Ser. No. 311,984
Int. Cl. H01q *19/12*
U.S. Cl. 343—761 **7 Claims**



1. A torus-type reflector antenna wherein the reflector surface is described by a substantially smooth generating curve rotated about an axis of rotation which is coplanar with the generating curve and disposed on the concave side of said curve and wherein the reflector surface, when illuminated with electromagnetic energy from a feed means lying at a feed point in the plane defined by said generating curve and said axis of rotation forms a substantially focused beam along an axis of beam direction defined by a line lying in said plane and drawn between the reflecting surface and a remote target point, the improvement comprising:

a. said generating curve substantially comprising a conic section, except a conic section which is the arc of a circle;

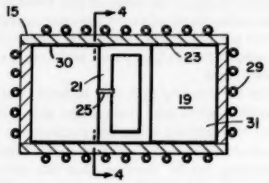
b. said reflector surface being formed by rotating said generating curve about an axis of rotation which intersects the axis of beam direction at an angle α which is not equal to 90°;

c. said feed means being capable of illuminating said reflector surface from one or more points on an arc, defined by the rotation of said feed point about the axis of rotation, whereby the axes of beam direction of beams formed and directed by the reflecting surface intersect the axis of rotation at said angle α and define the surface of a cone having a half angle of $180°-\alpha$ for $90°<\alpha<180°$.

3,852,764
PHASED ARRAY ANTENNA WITH PHASE SHIFTER COOLING

Bob L. Smith, 4402 Judith La. SW, Huntsville, Ala. 35805

Filed Oct. 10, 1973, Ser. No. 405,232
Int. Cl. H01q 13/00
U.S. Cl. 343—778 5 Claims

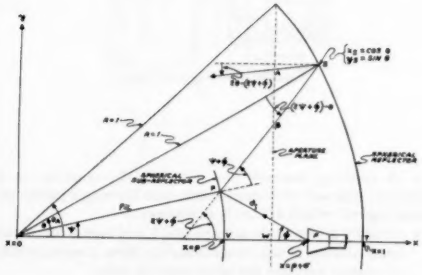


1. An antenna comprising a plurality of waveguides disposed in honeycomb relation and connected to a common source of microwaves to produce a wavefront; and toroidal phase shifters respectively disposed in said waveguides for selective control of the speed of the waves in said conduits for scanning the wavefront and wicking means lining portions of the inner surfaces of said waveguides and the outer surfaces of the toroidal phase shifters to dissipate heat by capillary action.

3,852,765
SPHERICAL DOUBLE REFLECTOR ANTENNA

Aaron D. Bresler, Merrick, N.Y.; Emanuel Stein, Fair Lawn, and M. Otto Erdmann, Denville, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 19, 1972, Ser. No. 316,617
Int. Cl. H01q 19/14
U.S. Cl. 343—781 18 Claims



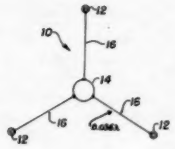
1. An antenna arrangement comprising a spherical main reflector surface, a spherical subreflector surface having a radius of curvature origin coincident with that for the main reflector, and at least one feed predeterminably arranged relative to said main and subreflector surfaces to illuminate said subreflector surface.

3,852,766
POLYPOLE BROADBAND ANTENNA ARRAY

Irving G. Olson, San Diego, Calif., and Hardy K. Landskov, Tempe, Ariz., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 10, 1973, Ser. No. 423,339
Int. Cl. H01q 21/00
U.S. Cl. 343—844 4 Claims

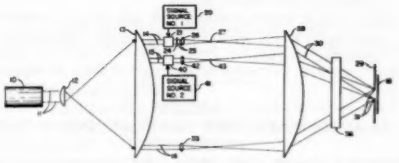
1. A broadband antenna array comprising:
a ground plane;
a plurality of identical, equal-length monopoles vertically disposed with respect to each other in a symmetrical manner at each of the apexes of a selectively predetermined geometrical configuration and upon said ground plane;
insulation means rigidly connected between each of said monopoles and said ground plane to provide a structurally rigid monopole configuration with respect to said ground plane; and,
energy feed means disposed and located in a central position with respect to all of said monopoles;
said array further including equal-length feed-wires connected from said feed means to each of said monopoles; said feedwires being oblique to said ground plane.



3,852,767
OPTICAL SIGNAL RECORDING METHOD

Robert E. Brooks, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 282,670, Aug. 22, 1972, Pat. No. 3,812,496. This application Dec. 19, 1973, Ser. No. 426,381
Int. Cl. G01d 9/28
U.S. Cl. 346—1 2 Claims



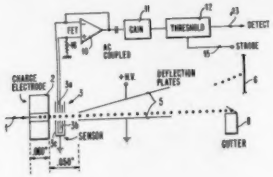
1. The method of optically recording a plurality of electrical analog signals, each having a wide range of amplitudes on a recording material comprising the steps of:
a. generating simultaneously a first, a second and a third collimated beam of coherent light;
b. directing said beams to coincide at an angle to each other in a predetermined plane;
c. disposing a recording material in the predetermined plane;
d. causing a continuous relative movement between the recording material and the beams in the predetermined plane;
e. modulating the first beam in accordance with a first analog signal to be recorded; and
f. modulating the second beam in accordance with a second analog signal to be recorded, the first and third beams forming a first predetermined angle at the predetermined plane, the second and third beams forming a second different predetermined angle at the predetermined plane, whereby two linear gratings are recorded on the recording material, each having a different grating constant and each being modulated by one of the two signals.

3,852,768

CHARGE DETECTION FOR INK JET PRINTERS

John M. Carmichael; Donald L. West, and Robert A. Williams, Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 17, 1973, Ser. No. 389,291
Int. Cl. G01d 18/00
U.S. Cl. 346—75 6 Claims



1. A sensor system for ink jet printers, particularly providing reduced noise and improved signal to noise ratio, comprising:

nozzle means for forming and propelling a stream of ink jet drops, charging means for charging said ink drops, deflecting means for deflecting said ink drops in accordance with the charge on said drops in a predetermined path toward a document to be printed, or the like;

sensor means positioned downstream from said nozzle means in the path of travel of said ink drops, said sensor means comprising an assembly of laminar elements including a sensor element, an inner shield, and an outer shield, and said sensor means having an aperture through which said ink drops pass, the arrangement being such that drops passing through said aperture are capacitively coupled to said sensor means for generating charges thereon in timed relation to passage of drops through the aperture of said sensor means;

means interconnected with said outer shield for electrically grounding said outer shield to thereby reduce noise pickup by said sensor means;

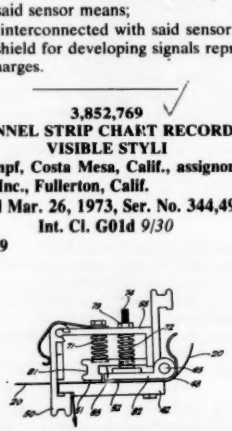
and a circuit interconnected with said sensor element and said inner shield for developing signals representative of detected charges.

3,852,769

DUAL CHANNEL STRIP CHART RECORDER WITH VISIBLE STYLI

Richard S. Kampf, Costa Mesa, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 26, 1973, Ser. No. 344,498
Int. Cl. G01d 9/30
U.S. Cl. 346—49 4 Claims



1. In a chart recorder adapted for forming closely spaced multiple traces from one side of a section of chart paper that are viewable from the other side of the chart paper,

means for selectively aligning said section of chart paper within a recording station, said chart paper having first and second sides;

a transparent viewing and writing plate position at said recording station adjacent the first side of said section of the chart;

two flexible bands longitudinally movable parallel to each other in a plane parallel to said chart paper adjacent the second side of said chart paper;

two styli located at said recording station on the second side of said chart paper, each of said styli projecting from the surface of one of said bands transversely thereto toward said second side of said chart paper for forming a trace on said chart paper that is visible from the first side of said chart paper through said viewing and writing plate, each stylus being at the edge of one band adjacent the edge of the other band whereby they are movable in closely adjacent parallel paths, said paths being also parallel to said section of said chart paper and to said viewing and writing plate, and

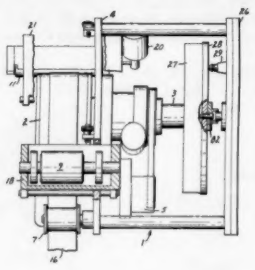
means for causing said styli to bear continuously and resiliently against said chart paper and said transparent vewing and writing plate for causing the chart paper to be pressed against the viewing and writing plate and thereby forming traces thereon that are immediately viewable through said viewing and writing plate.

3,852,770

CODED LEGEND MARKING ASSEMBLY HAVING TRANSMIT AND RECEIVE PRINTING CIRCUITRY

Derrick A. Jones, and Michael G. Golden, both of St. Paul, Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed May 21, 1973, Ser. No. 362,094
Int. Cl. G01d 15/06
U.S. Cl. 346—74 ES 11 Claims



1. A marking assembly for automatically marking on a dielectric tape web various patterns, each forming a particular coded legend, which assembly comprises:

a rotatably driven drum around which said tape is advanced upon rotation of said drum whereby there is substantially no slipage between the drum and the web;

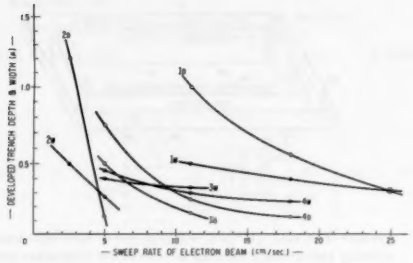
coded legend marking means disposed at the outer cylindrical surface of said drum for producing said coded legends on said tape web, said marking means including an array of individually controlled electrodes supported on said drum; and

actuating circuitry for selectively energizing said marking means such that said marking means produces on said web a pattern from particular ones of said controlled electrodes to form a particular coded legend on the web to impart information about an object upon which the web is to be affixed at the conclusion of the marking operation, which circuitry includes a circuit branch having a transmit circuit portion that is nonrotatably disposed on said assembly and a receive circuit portion that is physically separated from said transmit portion and is positioned to rotate in correspondence with said drum whereby said circuit portions communicate with each other to provide legend printing data to said controlled electrodes.

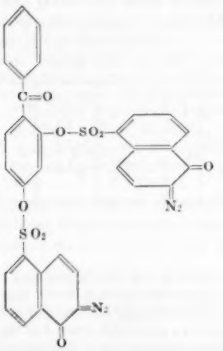
3,852,771
ELECTRON BEAM RECORDING PROCESS

Daniel Louis Ross, Princeton, and Lucian Anthony Barton, Trenton, both of N.J.J, assignors to RCA Corporation, New York, N.Y.

Filed Feb. 12, 1973, Ser. No. 332,025
Int. Cl. G01d *15/06*
U.S. Cl. 346—74 E **5 Claims**



1. In a method of recording information whereby a modulated beam of electrons is scanned across a surface of an electron beam sensitive material which becomes more soluble in a developer solvent when impinged upon by the beam of electrons and the electron beam sensitive material is developed with the developer solvent so as to remove the solubilized portion, the improvement which comprises employing in an electron beam sensitive layers of said material a mixture consisting essentially of from about 1 to about 50% by weight, as based on the total weight of the mixture of an active compound of the structure



and an alkali soluble resin.

3,852,772
MECHANICALLY CYCLED INK JET PRINTER

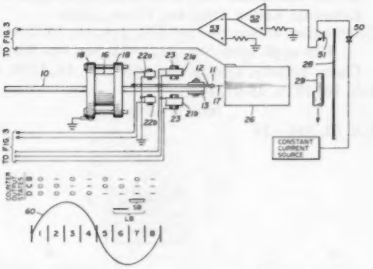
Richard M. Hecht, and Hubert D. Faulkner, both of Dallas, Tex., assignors to Recognition Equipment, Incorporated, Irving, Tex.

Filed Sept. 3, 1971, Ser. No. 177,587
Int. Cl. G01d *15/18*
U.S. Cl. 346—75 **4 Claims**

1. An ink jet printer for printing a line of data on a document during relative movement between the printer and the document which comprises:

a. a nozzle structure for projecting a stream of ink droplets toward the document, said nozzle structure includes a metal mounting bar,

b. means for mechanically moving the nozzle cyclically in a direction lateral to the axis of the nozzle to cyclically alter the direction of travel of successive droplets and produce a droplet pattern, said moving means includes a pair of field coils located on opposite sides of said mounting bar, and means for cyclically energizing said coils to repeatedly deflect said mounting bar between said coils,



c. means for selectively charging the droplets issuing from the nozzle to a potential above a predetermined level,

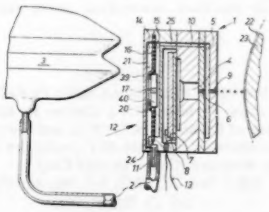
d. means for establishing a deflecting field in a region through which the droplets pass,

e. an ink catcher adjacent to the path of said droplets, and f. control means synchronized with the movement of the nozzle for selectively energizing said charging means to charge the droplets in those portions of the droplet pattern not desired on the document whereby the reaction of the charged droplets with said field directs said charged droplets into said catcher.

3,852,773
INK EJECTION PRINTING DEVICES

Heinrich Sicking, Grafschaft, and Eilt-Heyc Rittberg, Wilhelmshaven, both of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed Feb. 28, 1974, Ser. No. 446,899
Claims priority, application Germany, Mar. 8, 1973, 2311383; Mar. 27, 1973, 2315151
Int. Cl. G01d *15/16*
U.S. Cl. 346—140 **7 Claims**



1. In a device for applying a fluid in drop form to a surface, which device includes a fluid ejector head provided with at least one chamber having an outlet channel, connector means and an inlet channel arranged to be connected to a line for receiving fluid from a reservoir and for supplying such fluid to the inlet channel, and means for applying pressure pulses to the fluid in the chamber, the improvement comprising a valve disposed in said ejector head in the fluid flow path between

said connector means and said inlet channel, said valve constituting means for reducing pressure surges in the fluid in the forward direction of fluid flow and those in the direction opposite the flow, and for closing the flow path between said connector means and said inlet channel when there is a drop in pressure in such line.

3,852,774

ELECTRIC SHUTTER FOR SINGLE LENS REFLEX CAMERA

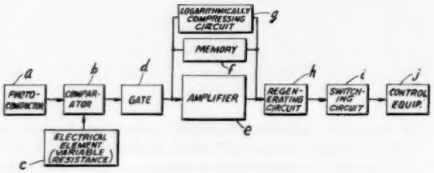
Tatsuya Taguchi, Tokyo; Yukio Lura, Kawasaki, and Yoshiyuki Takishima, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Ohta-ku, Tokyo, Japan

Continuation of Ser. No. 106,872, Jan. 15, 1971, abandoned. This application Nov. 21, 1972, Ser. No. 308,442

Claims priority, application Japan, Jan. 16, 1970, 45-4703; Feb. 10, 1970, 45-013174

Int. Cl. G01j *1/00*

U.S. Cl. 354—24 **30 Claims**



1. An electric shutter, comprising light sensing means for producing an output corresponding to the light sensed, storage means coupled to said sensing means for storing electrical values on the basis of the output from said sensing means, compression means coupled to said storage means and said sensing means for logarithmically compressing the output of the sensing means so that the value stored by said storage means is a logarithmic compression of the output of said sensing means, variable timing means for opening and closing the shutter at a variable rate after initiation of the timing means, circuit means coupling said storage means to said timing means for varying the rate at which the timing means operates on the basis of the value in said storage means, first switch means coupled to said storage means for decoupling said storage means from said light sensing means and said compression means so as to cause said storage means to maintain a constant value after operation of said first switch means, and second switch means operable after said first switch means for initiating operation of said variable timing means, said storage means including an operational amplifier and capacitor in feedback connection across said operational amplifier.

3,852,775

MOVING BELT SCANNING PRINTER

Donald S. Cary, Perinton, N.Y.; Charles H. Hutchinson, deceased, late of Rochester, N.Y. (NY), and Carol W. Hutchinson, administratrix, Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn., by said Cary

Filed Dec. 20, 1973, Ser. No. 426,985

Int. Cl. B41b *15/06*

U.S. Cl. 354—14 **3 Claims**

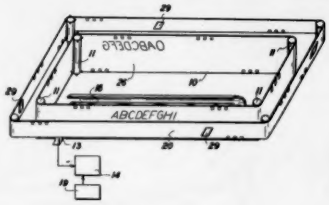
1. An arrangement for scanning character images across a photosensitive medium comprising:

an endless character belt having formed thereon a plurality of light transmitting areas corresponding to a font of characters,

an endless aperture belt concentrically arranged with and around said character belt and having a portion thereof located between said medium and said character belt, said aperture belt containing a plurality of light transmitting zones each being spaced from each other at least a distance approximately equal to the length of a printed line of characters to be printed on the medium,

flash illumination means located interior the closed surface formed by said character belt,

means for continuously rotating said character belt and said aperture belt with said character belt moving at a speed



greater than said aperture belt and one of said light transmitting zones being located at successive character print positions opposite said medium, and

control means for flashing said lamp successively when selected characters to be printed pass in alignment with the light transmitting zone at each character print position whereby selected characters on said character belt are projected onto said medium.

3,852,776

CONTROL ARRANGEMENT FOR A CAMERA SHUTTER

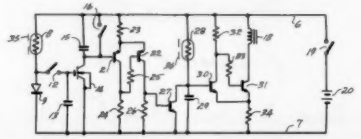
Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Nov. 19, 1973, Ser. No. 417,130

Claims priority, application Japan, Nov. 22, 1972, 47-116572

Int. Cl. G03b *7/08*; **G01j** *1/46*

U.S. Cl. 354—31 **5 Claims**



1. In a camera having a shutter button and a shutter mechanism having an electromagnet, a front curtain that moves upon actuation of the shutter button, and a rear curtain that is released incident to electrical control of the electromagnet so as to move in spaced relation with the front curtain, an arrangement for controlling the exposure time of the shutter mechanism in accordance with the amount of light from an object to be photographed and with an exposure factor, which comprises:

first and second tandem-connected, separately controllable timing circuits operable for respectively defining in succession first and second sub-intervals of the exposure time, the first timing circuit commencing to define the first sub-interval when the leading curtain begins to move, and the second timing circuit electrically controlling the electromagnet so that the rear curtain is released at the end of the second sub-interval; and

means for separately controlling the first and second timing circuits so that the duration of the first sub-interval is dependent upon said amount of light but is independent

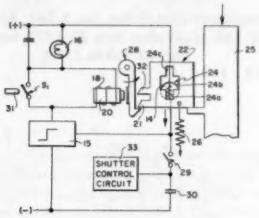
of said exposure factor and the duration of the second sub-interval is dependent upon both said amount of light and said exposure factor.

3,852,777

EXPOSURE CONTROL APPARATUS

Ernst Lieser, Stuttgart-Bad Cannstatt; Wolfgang Ort, Grunbach; Otto Wisst, and Clemens Hopfner, both of Stuttgart, all of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 15, 1974, Ser. No. 451,713
Int. Cl. G03b *7/08, 17/18*
U.S. Cl. 354—49 **8 Claims**



1. In a camera adapted to receive film of various exposure latitudes and to make exposures of varying duration, the combination comprising:

light sensitive means for sensing the intensity of received scene illumination and having a parameter variable as the intensity of illumination thereon varies;

exposure control apparatus, coupled with said light sensitive means and being responsive to variations of said parameter, for varying the duration of an exposure in relation to said parameter and thus to received illumination intensity;

means for sensing the presence in said camera of film of a predetermined exposure latitude;

control means, coupled with said light sensitive means and cooperative therewith and with said film sensing means, to become active upon the concurrent sensing of the presence of such film of predetermined exposure latitude and an illumination intensity in a range of predetermined intensities that correspond to exposures exceeding a predetermined duration, for providing a control output; and

illumination adjustment means, coupled with said control means and being responsive to said output, for increasing the illumination received by said light sensitive means.

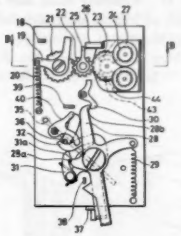
3,852,778

SINGLE LENS REFLEX CAMERA OF TTL PHOTOMETRY TYPE

Yukio Iura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 98,552, Dec. 16, 1970, abandoned. This application Nov. 13, 1972, Ser. No. 306,038
Claims priority, application Japan, Dec. 19, 1969, 44-105446
Int. Cl. G03b *7/08*
U.S. Cl. 354—51 **11 Claims**

1. A through-the-lens light measuring and exposure control apparatus for a single lens reflex camera having an objective lens, comprising a photosensitive element exposed to light through the objective lens and having a delayed time response characteristic which produces a time delay, shutter means, an information storage capacitor, openable and closable switching means selectively connecting said capacitor to said element for inserting information from said element into said storage capacitor, a view finder including a movable reflector, normally open automatic diaphragm means, diaphragm driving means for driving said diaphragm means to a predetermined aperture, operation initiating means coupled to said driving means for initiating operation of said driving means and coupled to said switching means for closing said switching means, said driving means operating independently of said initiating means after the operation of said driving means is initiated and said driving means being engaged with said switching means to open said switching means and said shutter means when said diaphragm reaches its predetermined aperture, control means responsive to said capacitor for closing said shutter means in accordance with the information in said capacitor, and actuating means coupled to said driving means and said movable reflector for moving said movable reflector so as to block the light path to said element when said shutter means has been opened; said driving means including delay means for delaying the driving action, for a predetermined time longer than the time delay produced by the delayed time response characteristic, after said initiating means closes said switching means to allow the capacitor to store information from said element.

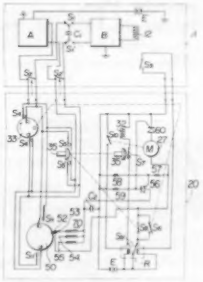


3,852,779

RELEASE DEVICE FOR A CAMERA HAVING A MEMORY TYPE ELECTRONICS TIME CONTROL DEVICE

Masayoshi Yamamichi, Kanagawa-ken, and Hiroshi Aizawa, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 29, 1973, Ser. No. 375,034
Claims priority, application Japan, July 5, 1972, 47-67403
Int. Cl. G03b *7/08*
U.S. Cl. 354—51 **15 Claims**



1. Camera having an automatic exposure control device comprising a light receiving transducer element for producing an exposure signal, exposure signal storage means having a

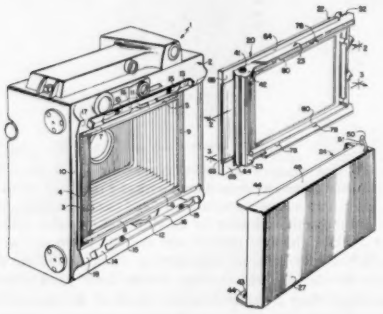
capacitor for storing an exposure signal responsive to the output from the transducer element, exposure control means for controlling an exposure in said exposure signal storage means, release means for actuating the control means to produce an exposure, retaining means for retaining the signal in said storage means for multiple exposures regardless to successive release operations, and a setting means for transferring said retaining means from a non-retaining condition to retaining condition, thereby multiple exposure being achieved without successive exposure signal holding operations.

3,852,780

FILM PACK ADAPTER

Rolf M. Augustin, Jr., Wellesely Hills, and Donald E. Moodie, Marblehead, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 5, 1973, Ser. No. 338,098
Int. Cl. G03b *17/50*
U.S. Cl. 354—86 **9 Claims**



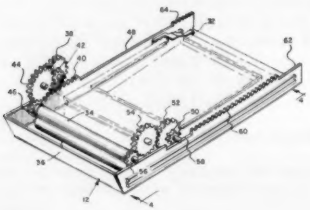
1. A front housing for a film pack holder comprising a plane front wall formed with a rectangular framing aperture, a rectangular groove formed in said front wall on a first side of said front wall and surrounding said framing aperture, a series of bosses formed on a second side of said front wall opposite said first side and surrounding said framing aperture within the confines of said rectangular groove, and means forming fastener receiving apertures extending through said front wall and into each of said bosses, said fastener receiving apertures being located between said groove and said framing aperture in an array extending about three sides of said framing aperture.

3,852,781

VARIABLE DRIVE FOR PHOTOGRAPHIC APPARATUS

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 23, 1973, Ser. No. 418,656
Int. Cl. G03b *17/50*
U.S. Cl. 354—86 **14 Claims**



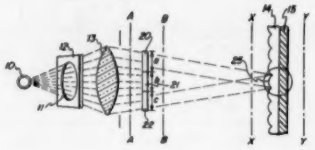
1. Apparatus for conveying an article comprising:
roller means including at least one roller contacting the surface of an article being conveyed during movement of the article past said roller means;
transport means for supporting and transporting the article to said roller means; and
drive means coupled with said roller and said transport means and actuated by said transport means to vary the driving force applied by said roller to the article in proportion to variations in resistance to movement of the article past said roller means.

3,852,782

IMAGING SYSTEM

Robert W. Gundlach, Victor, and Lloyd F. Bean, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 1,591, Jan. 9, 1970, abandoned. This application June 28, 1972, Ser. No. 266,966
Int. Cl. G03b *35/08*
U.S. Cl. 354—110 **13 Claims**



1. A photographic apparatus comprising:
a. optical means for producing a light image;
b. a photoreceptor;
c. light attenuation means varying in light transmission density equally at all light wavelengths in preselected different light density ranges for differentially attenuating said light image in corresponding different light density ranges as said light image is transmitted through said light attenuation means; and
d. lenticulated means comprising a surface having a plurality of cylindrically shaped segments for receiving a portion of said differentially attenuated light image and for focusing that portion of the differentially attenuated light image onto a corresponding segment of the photoreceptor in preselected contiguous areas,
wherein said apparatus is capable of forming a reproduction of an original image which when viewed in its entirety will show more of the image information present in the original image than a reproduction of the original image which was recorded on the photoreceptor without using the light attenuation means and the lenticulated means.

3,852,783

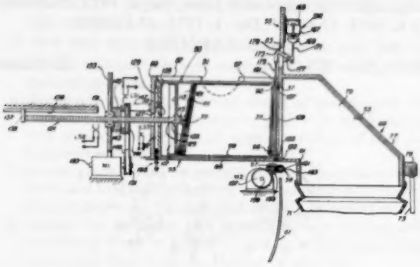
PHOTOGRAPHIC APPARATUS FOR SUCCESSIVELY PRESENTING A SEQUENCE OF FILM UNITS TO AN EXPOSURE STATION AND THEN PROCESSING THE FILM UNITS

C. Bruce Kennedy, and John F. Pasieka, both of Acton, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 321,668, Jan. 8, 1973. This application Jan. 2, 1974, Ser. No. 429,763
Int. Cl. G03b *19/10*
U.S. Cl. 354—174 **6 Claims**

1. A photographic cassette for holding a stack of film units of the type having pods of processing fluid at one end so that the film units stack at progressively greater angles relative to a first film unit in a stack as the number of film units in the stack is increased, comprising wall means forming a housing for receiving a stack of such film units, means forming a framing aperture in said housing adapted to register with a first film unit in a stack in said housing, force-receiving means adapted to be engaged by an external force-applying member, means

mounting said force-receiving means in said housing for movement toward and away from said framing aperture, a pressure plate adapted to engage the last film unit in a stack in said housing, and means pivotally mounting said pressure plate on said force-receiving means for rotation about an axis normal



to the direction of movement of said force-receiving means so that said pressure plate assumes a position parallel to the last film unit in a stack in said housing when a force directed toward said framing aperture is applied to said force-receiving member.

3,852,784

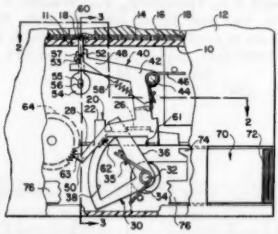
EARLY METERING FAILURE PREVENTION DEVICE

Jeffrey Richard Stoneham, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,620

Int. Cl. G03b *1/16, 9/68*

U.S. Cl. 354—206 **7 Claims**



1. A camera having a shutter and adapted for receiving a film having metering discontinuities spaced at predetermined intervals therealong, said camera comprising:

means for advancing a received film, said advancing means having an active condition wherein said advancing means is movable for advancing film and an inactive condition wherein said advancing means is locked against movement for advancing film;

means for metering a received film in predetermined increments by preventing further advancement of the film, said metering means comprising:

sensing means for engaging a metering discontinuity in a received film, said sensing means being movable to a metering position subsequent to engaging a metering discontinuity; and

means coupling said sensing means and said advancing means for placing said advancing means in said inactive condition in response to movement of said sensing means to said metering position;

means, including a member releasable from a cocked position, for actuating the shutter and for placing said advancing means in said active condition; and

means interconnecting said metering means and said shutter actuating means for preventing said sensing means from engaging a film discontinuity when said releasable member is not in its cocked position.

3,852,785

SELF-TIMER FOR A CAMERA

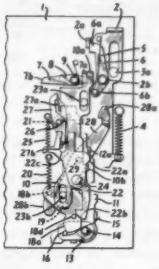
Masuo Ogihara, Chiba, and Tomoo Yonemoto, Funabashi, both of Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1974, Ser. No. 453,085

Claims priority, application Japan, Mar. 31, 1973, 48-38256

Int. Cl. G03b *9/64, 17/40*

U.S. Cl. 354—239 **3 Claims**



1. A self-timer for a camera having a depressable release plate having a camera release lever pivoted thereon and a shutter release lever actuated by said release lever when the depressable plate is depressed, the self-timer comprising, a self-release plate actuatable longitudinally, an interlocking lever pivotally mounted on the self-release plate, a governor having a rotatable gear for charging the governor, means for rotating the gear to charge the governor, a braking lever actuated by said interlocking lever for releasably locking said governor and for unlocking the governor, said gear having means for initiating movement of said self-release plate for transporting the interlocking lever to a position for camming the camera release lever out of the path of the shutter release lever when the depressable release plate is depressed when the governor is cocked for timed exposures, said interlocking lever having means releasing the governor when said depressable release plate is depressed and said interlocking lever is in said position, said governor having means restoring the self-release plate to a rest position when released by said braking lever, and said self-release plate having means actuating the shutter release lever when said governor restores it to said rest position.

3,852,786

SHUTTER ASSEMBLY HAVING MEANS FOR DAMPING THE RAPID MOTION OF THE SHUTTER BLADES

Eiichi Onda, Misato; Mitsuo Koyama, and Tadashi, both of Nakagawa, Chiba, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1973, Ser. No. 391,521

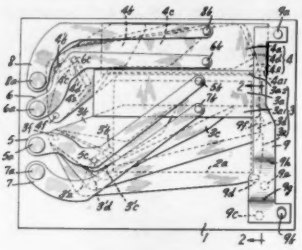
Claims priority, application Japan, Aug. 25, 1972, 47-98405

Int. Cl. G03b *9/20*

U.S. Cl. 354—252 **7 Claims**

1. A shutter assembly for a camera comprising: means defining a shutter aperture; a plurality of actuatable shutter blades comprising a first group of shutter-opening shutter blades actuatable through a working stroke from an extended

position wherein they close said shutter aperture to a retracted position wherein they open said shutter aperture, and a second group of shutter-closing shutter blades actuatable through a working stroke from a retracted position wherein they open said shutter aperture to an extended position wherein they close said shutter aperture; shutter actuating means for sequentially actuating the first and second shutter blade groups through their respective working strokes to effect first opening and then closing of said shutter aperture thereby defining an exposure; and damping means disposed along the path of



travel of both groups of the shutter blades and having first means responsive to engagement by a leading part of each gruop of said shutter blades past a given location corresponding to when said shutter blades have parts thereof overlying each other near completion of their working stroke and having second means for engaging with a succeeding part of said shutter blades in response to said engagement of said first means and said leading part to thereby effectively dampen the motion of each group of shutter blades and press the overlying parts of said shutter blades together.

3,852,787

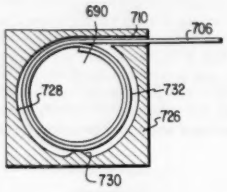
THREE DIMENSIONAL PICTURES AND METHOD OF COMPOSING THEM

Jerry Curtis Nims, Atlanta, Ga., and Allen Kwok Wah Lo, Kowloon, Hong Kong, assignors to Dimensional Development Corporation, Atlanta, Ga.

Division of Ser. No. 171,269, Aug. 12, 1971,. This application July 16, 1973, Ser. No. 379,387

Int. Cl. G03b *17/26, 1/44, 17/28*

U.S. Cl. 354—275 **2 Claims**



1. In a camera having a housing provided with a film supply well and a film take-up well, the improvement wherein said take-up well is formed by a body portion having a generally cylindrical inner surface, means providing a film entrance mouth into said take-up well substantially tangential to said inner surface, and a rounded rib formed on said inner surface substantially dimetrically opposite said entrance mouth for engagement with film entering said take-up well so as to tend to hold said film out of substantial frictional engagement with said inner surface.

3,852,788

CAMERA OUTFIT FOR CONNECTING A FLASH UNIT TO A PHOTOGRAPHIC CAMERA

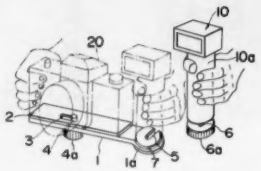
Hiroshi Ueda, Nara, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed June 12, 1973, Ser. No. 369,215

Claims priority, application Japan, July 6, 1972, 47-80456; July 6, 1972, 47-80457; Dec. 1, 1972, 47-138581

Int. Cl. G03b *17/56*

U.S. Cl. 354—293 **22 Claims**



1. A connecting device for connecting detachably between a flash unit and a photographic camera, comprising: a solid strip, means formed in said solid strip for securing said solid strip to said camera, a groove formed at one end of said solid strip, and means for mounting said flash unit to said groove, said groove extending completely through said solid strip, said mounting means having one end formed with a head portion and the other end engaged to said flash unit, a substantially intermediate portion thereof being adapted to be inserted through said groove when said flash unit is to be mounted to said solid strip.

3,852,789

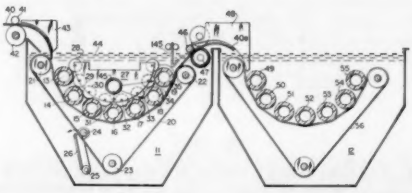
RAPID ACCESS GRAPHIC ARTS FILM PROCESSOR

Harold D. Russell, Clinton, N.Y.; Gerald Stone, Placentia, Calif.; James Lin, Springfield, Va.; William F. Hamilton, Alexandria, Va., and James Allen Royston, Woodbridge, Va., assignors to LogEtronics Inc., Springfield, Va.

Filed June 1, 1973, Ser. No. 365,945

Int. Cl. G03d *13/08*

U.S. Cl. 354—339 **10 Claims**



1. A graphic arts film processor for rapidly processing sheets of graphic arts film, which comprises

a. a first transport section having a plurality of rollers arranged to define one side of a horizontal arcuate film transport path, said path having a chord to middle ordinate ratio of at least 1:1,

b. a second transport section having a plurality of endless belts arranged in side-by-side relation to one another below said rollers of said first transport section to define the other side of said film transport path, each of said belts being associated with a plurality of said rollers and extending along a horizontal arcuate also having a chord to middle ordinate ratio of at least 1:1 whereby each said belt is arranged to follow the radius of curvature of said

one side of said arcuate film transport path defined by said plurality of rollers,

c. means for urging each of said belts into tangential contact with a plurality of the rollers of said first transport section to provide a positive drive therebetween for advancing sheets of film along said transport path, said belts being operative to support said rollers to prevent deflection of said rollers,

d. first and second fluid processing tanks, said first and second transport sections mounted within said first fluid processing tanks,

e. first guide means for guiding sheets of graphic arts film into said arcuate film transport path with the emulsion side of said film in contact with the rollers of said first transport section,

f. second guide means for guiding sheets of graphic arts film from said first tank to said second tank after said film had been transported through said arcuate transport path,

g. means for supplying and circulating said photographic processing fluid in said first tank to remove exhausted processing fluid from the surface of said film,

h. means for driving said belts and rollers to cause each to rotate in synchronism with one another in a common direction and thereby transport said film through said processing fluids.

3,852,790

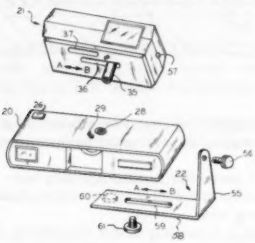
UNIVERSAL MOUNT FOR ELECTRONIC FLASH UNIT

Jack A. Robinson, Chicago, Ill., assignor to Acme-Lite Manufacturing Co., Chicago, Ill.

Filed June 7, 1973, Ser. No. 367,780

Int. Cl. G03b *15/05*

U.S. Cl. 354—145 **11 Claims**



1. A universal electronic flash unit having mounted thereon an integral longitudinally and rotatably moveable post with a cross-section which fits into a percussive flash cube socket built in a camera, said moveable post making a mechanical connection between said flash unit and said camera, means for completing an electrical circuit between said flash unit and a shutter synchronized operator on the camera, and means for mechanically stabilizing said mechanical connection, said stabilizing means comprising a longitudinally adjustable bracket for fixedly attaching said flash unit on the camera.

3,852,791

VIEWFINDER MIRROR BUFFER DEVICE FOR A SINGLE-LENS REFLEX CAMERA

Susumu Eukuda, Hyogo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan

Filed Aug. 31, 1973, Ser. No. 393,364

Claims priority, application Japan, Sept. 4, 1972, 47-88439

Int. Cl. G03b *19/12*

U.S. Cl. 354—152 **6 Claims**

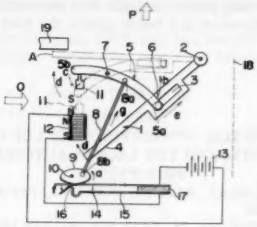
1. In a single-lens reflex camera having a body, a film plane, a viewfinder and a mirror which is moved relative to the body simultaneously with shutter operation from a first position for introducing light to the viewfinder to a second position for introducing light to the film plane, an improved buffer device for the mirror, comprising:

a. a magnet,

b. electromagnetic means,

c. switch means for energizing said electromagnetic means when said mirror is moved, and

d. mechanical linkage means coupling said mirror to one of



said magnet and electromagnetic means and arranged to cause relative movement between said magnet and said electromagnetic means in response to movement of said mirror, means mounting the other of said magnet and electromagnet to the camera body, to thereby produce a restraining force opposing such relative movement and hence opposing the relative movement of said mirror when said electromagnetic means is energized.

3,852,792

PHOTOGRAPHIC APPARATUS

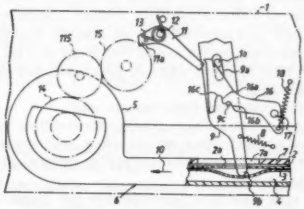
Erhard Nikitsch; Johann Putscher, both of Munchen, and Peter Utschig, Unterhaching, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 23, 1973, Ser. No. 390,922

Claims priority, application Germany, Aug. 29, 1972, 2242364

Int. Cl. G03b *1/62, 19/04, 1/14*

U.S. Cl. 354—213 **11 Claims**



1. In a photographic apparatus for use with roll film having a row of perforations of predetermined length, one for each film frame, and with a web of backing paper for the film, a combination comprising film transporting means operable to advance the film and backing paper along a predetermined path; a movable feeler device having a scanning portion adjacent to said path opposite the backing paper and being in register with the row of perforations, the width of said scanning portion as considered in the direction of film movement along said path being less than said predetermined length; biasing means for urging said scanning portion against the film in said path so that said scanning portion enters an oncoming perforation during transport of the film and is thereupon entrained by the moving film; control means movable between

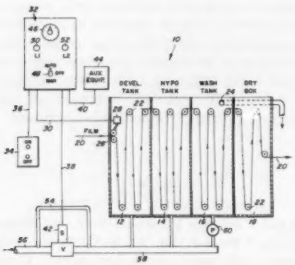
first and second positions in which said control means respectively permits and effects an interruption of the transport of film along said path; and a displaceable motion transmitting device arranged to receive motion from said feeler device while said scanning portion is being entrained by the film in said path and to thereby effect the movement of said control means from said first to said second position as well as to displace said scanning portion in the adjacent perforation so that said scanning portion extends with clearance through the adjacent perforation and bears against the backing paper in said path.

3,852,793

APPARATUS FOR CONSERVING THE USE OF WATER ELECTRICITY, AND THE LIKE IN AUTOMATIC FILM PROCESSORS

Earl A. McClintock, 6406 Riverton Ave., North Hollywood, Calif. 91606

Filed Jan. 31, 1973, Ser. No. 328,390
Int. Cl. G03d *3/02*
U.S. Cl. 354—324 **10 Claims**



1. An apparatus for conserving the resources consumed by a conventional photagraphic processor in which a plurality of film elements are treated, comprising:

a mechanically operable switch means for detecting the presence of a film element as it enters said processor;

an electronic unit actuatable by said switch means; and

a valve means responsive to said electronic unit for controlling the flow of water into said processor, said electronic unit including:

a resettable motorized timer means; and

a relay type means including means for resetting said resettable motorized timer means when said switch means detects the presence of another film element as it enters said processor;

wherein said electronic unit controls the duration of the flow of said water through said valve means.

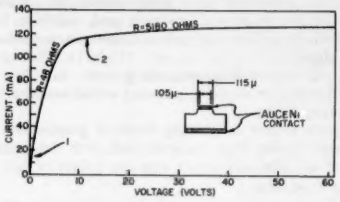
3,852,794

HIGH SPEED BULK SEMICONDUCTOR MICROWAVE SWITCH

Gerald L. Pearson, Portola Valley, and Giovanni A. Foggiato, Cupertino, both of Calif., assignors to The Board of Trustees of Leland Stamford Junior University, Stamford, Calif.

Filed May 11, 1972, Ser. No. 252,423
Int. Cl. H03k *17/56, 17/74;* **H01p** *1/10*
U.S. Cl. 357—3 **2 Claims**

1. A semiconductor switching device including a body of semiconductor material and spaced terminal means on said body whereby at least a portion of said body is disposed between said terminals in which said body of material comprises *n*-type semiconductor $Ga_{1-x}Al_xAs$ where x is 0.40 ± 0.03 to provide energy bands having small energy differences and



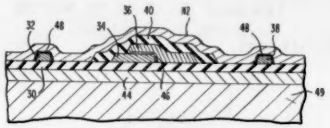
which switches from a low resistance to a high resistance with current saturation responsive to a switching voltage applied between said terminals.

3,852,795

JOSEPHSON TUNNELING CIRCUITS WITH SUPERCONDUCTING CONTACTS

Irving Ames, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1973, Ser. No. 320,784
Int. Cl. H01l *9/00, 3/00*
U.S. Cl. 357—5 **12 Claims**



1. A superconducting circuit on a substrate comprising:

a. a first patterned superconducting layer formed over said substrate,

b. a second patterned superconducting layer formed over said substrate subsequent to formation of said first superconducting layer,

c. a Josephson tunnelling device comprising an underlying portion of said first superconducting layer, a portion of said second superconducting layer overlaying said underlying portion and a tunnel barrier therebetween,

d. a third patterned superconducting layer formed on said substrate subsequent to formation of said second superconducting layer,

e. at least one superconducting contact between a portion of at least one of said first and second superconducting layers and a portion of said third superconducting layer which overlays and contacts said portion of at least one of said first and second superconducting layers, and

f. said third superconducting layer including a material having a higher free energy of oxide formation than the said superconducting layer which forms the said superconducting contact with said third superconducting layer.

3,852,796

GaN SWITCHING AND MEMORY DEVICES AND METHODS THEREFOR

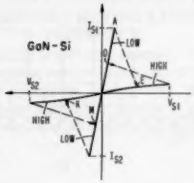
Jerome J. Cuomo, Bronx, and Harold J. Hovel, Putnam Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 8, 1972, Ser. No. 260,861
Int. Cl. H03k *17/56, 17/70*
U.S. Cl. 357—16 **23 Claims**

1. A non-volatile memory, comprising:

a heterojunction device having a first region of crystalline silicon of one conductivity type; and

a second region of crystalline GaN forming a junction with said first region, said GaN containing a high density of material imperfections including deep energy traps existing at densities greater than approximately 10^{18} cm^{-3} with said traps including double or more acceptor-like traps in the bulk of said GaN and donor-like traps in the vicinity of said junction so as to form a memory that exhibits a non-volatile high impedance state and a non-volatile low impedance state with both said high impedance state and



said low impedance state being accessible in both a bipolar and unipolar mode; and

means for accessing said non-volatile high impedance state and non-volatile low impedance state, said means for accessing including means for applying unipolar voltage pulses to said device for accessing both said non-volatile high impedance state from said non-volatile low impedance state and said non-volatile low impedance state from said non-volatile high impedance state using said unipolar pulses.

3,852,797

ELECTROLUMINESCENT SEMICONDUCTOR DEVICE

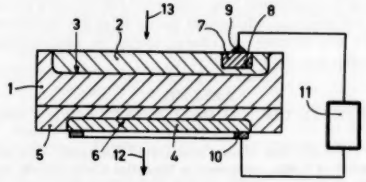
Jacques Lebailly, and Jean-Claude Dubois, both of Caen, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 7, 1973, Ser. No. 338,841

Claims priority, application France, Mar. 14, 1972, 72.08826

Int. Cl. H01l *15/00*

U.S. Cl. 357—19 **10 Claims**



1. A monolithic semiconductor device comprising four successive regions of alternately p and n conductivity type which together constitute three p-n junctions, the first p-n junction between first and second ones of said regions having electroluminescent properties and said first region and a fourth one of said regions comprising ohmic contact electrodes, a second one of said regions comprising at least two zones, a first one of said zones adjoining said first region and having the same composition as said first region and a second one of said zones adjoining a third one of said regions and substantially isolating optically said third region from the first junction, said second zone consisting essentially of a material having a forbidden energy bandgap corresponding to an energy level which is smaller than the energy of the photons emitted by said first junction, and said third region consisting essentially of a material having photoconductive properties and comprising a surface that admits photons originating outside the device

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3,852,798

ELECTROLUMINESCENT DEVICE

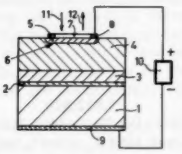
Jacques Leabailly, and Jean-Claude Dubois, both of Caen, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,217

Claims priority, application France, Mar. 14, 1972, 72.08823

Int. Cl. H01l *15/00*

U.S. Cl. 357—19 **12 Claims**



1. An electroluminescent device comprising:

a. a monolithic crystalline semiconductor body, said body having in electrical series relationship

i. a first surface region of a first conductivity type,

ii. a second region of a second conductivity type opposite to said first type and adjoining the first region and forming with the latter a P-N junction having electroluminescent properties and capable of emitting photons within a certain energy range when current is passed through the P-N junction,

iii. a filter layer of the second conductivity type, and

iv. a photoconductive semi-insulating layer of the second conductivity type and having a forbidden bandwidth which is smaller than the energy of the photons emitted by the electroluminescent junction, said filter layer having a forbidden bandwidth which lies between that of the photoconductive layer and the energy of the photons emitted by the electroluminescent junction, and

b. first and second electrodes connected to the body for passing current through the series connected regions and layers whereby the photon output from the device is controlled by the resistance of the photoconductive layer which in turn is controlled by external illumination.

3,852,799

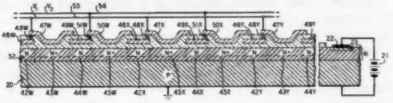
BURIED CHANNEL CHARGE COUPLED APPARATUS

Robert Henry Walden, Warren, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Apr. 27, 1973, Ser. No. 355,214

Int. Cl. H01l *13/00*

U.S. Cl. 357—23 **9 Claims**



1. A buried channel charge coupled device of the type adapted for storing and sequentially transferring mobile charge carriers coupled to locally induced internal potential wells comprising

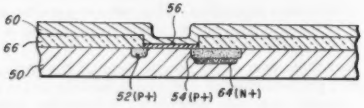
a semiconductive storage layer of a first conductivity type overlying a barrier layer;
an insulating layer overlying the storage layer;
contact means for biasing said storage layer in order to deplete said storage layer of mobile charge carriers;
a plurality of electrodes disposed over and forming a path along the surface of the insulating layer;
detection means at one end of said path for detecting mobile charge carriers in said storage layer;
means in response to two-phase voltages of sufficient magnitude applied between the electrodes and the storage layer for causing under each electrode the formation of an asymmetric potential well internal to the storage layer, the asymmetry in the potential wells being sufficient in response to the two-phase voltages for causing mobile charge carriers to propagate unidirectionally in the bulk of said storage layer toward said detection means.

3,852,800

ONE TRANSISTOR DYNAMIC MEMORY CELL

Atsushi Ohwada, and John A. Arnold, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 168,324, Aug. 2, 1971, Pat. No. 3,740,731. This application Apr. 6, 1973, Ser. No. 348,781
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 357—24 **2 Claims**



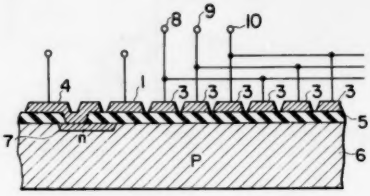
1. A dynamic data storage cell comprising:
a. a semiconductor substrate of one conductivity type;
b. a first elongated diffused region of opposite conductivity type extending to the surface of said substrate;
c. a second diffused region of said opposite conductivity spaced from said first diffused region and substantially parallel thereto, said second diffused region also extending to the surface of said substrate;
d. a third diffused region underlying said second diffused region, of said one conductivity type and having a lower resistivity than said substrate, formed within at least a portion of the area occupied by said second diffused region, forming a P-N junction therewith;
e. an insulating layer covering the surface of said substrate, said insulating layer having a first thin region overlying an area of said substrate bridging said first and second diffused regions thereby defining a channel of a FET, and a second thin region overlying a portion of said second diffused region;
f. a first elongated conductive region extending over said first thin insulating region, thereby forming a gate of said FET, said conductive region substantially orthogonal to said first diffused region;
g. a second elongated conductive region spaced from and substantially parallel to said first elongated conductive region, extending over said second thin region to form a capacitor; and
h. means for connecting said second conductive region to said substrate.

3,852,801

CHARGE-COUPLED SEMICONDUCTOR DEVICE PROVIDED WITH BIASING CHARGES

Yokichi Itoh, Hachioji; Hideo Sunami, Musashino, and Yoshiaki Kamigaki, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 29, 1972, Ser. No. 319,612
Claims priority, application Japan, Dec. 29, 1971, 46-1656
Int. Cl. H01l *11/14*
U.S. Cl. 357—24 **21 Claims**



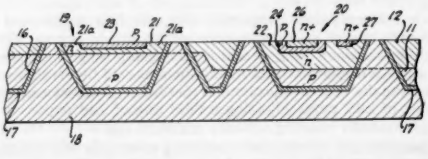
1. A charge-coupled semiconductor device provided with biasing charges comprising:
a semiconductor body of a first conductivity type;
a layer of insulating material disposed on a first surface of said semiconductor body;
first means, coupled to said semiconductor body, for injecting charge carriers into said semiconductor body;
a plurality of electrodes disposed on the surface of said layer of insulating material;
second means, coupled to said semiconductor body, for detecting charge carriers transferred thereto;
a second body made of a material selected from the group consisting of a semiconductor and a conductor, on which said semiconductor body is disposed, and which defines a rectifying junction with said semiconductor body;
third means for applying pulse voltages to said electrodes, so as to transfer said injected charge carriers along the interface between said semiconductor body and said layer of insulating material, the pulse voltages being of sufficient magnitude to form depletion regions, the edges of which come into contact with said rectifying junction, when the quantity of charge stored in said interface is less than a predetermined normalized charge, so that charge carriers are injected from said second body into a portion of said interface adjacent at least one of said electrodes, until the quantity of charge stored in said interface reaches a predetermined level.

3,852,802

INTEGRATED CIRCUIT HALL EFFECT DEVICE AND METHOD

Helmut F. Wolf, San Mateo, and David Kleitman, Los Altos Hill, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 249,248, May 1, 1972, abandoned. This application Oct. 10, 1973, Ser. No. 405,066
Int. Cl. H01l *19/00*
U.S. Cl. 357—27 **5 Claims**



1. An integrated circuit comprising: a single crystal semiconductor body of one conductivity type, a layer of semicon-

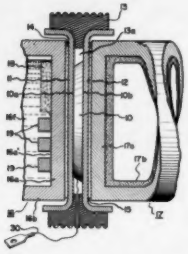
ductive material of the opposite conductivity type carried on one face of said semiconductor body said layer having a planar outer surface and a stepped inner boundary contiguous to said semiconductor body to provide both a relatively thick layer and a relatively thin layer; means for electrically isolating at least a portion of said thin layer from at least a portion of said thick layer; a Hall effect device formed in said thin layer portion; and a transistor formed in said thick layer portion.

3,852,803

HEAT SINK COOLED POWER SEMICONDUCTOR DEVICE ASSEMBLY HAVING LIQUID METAL INTERFACE

Gunnar E. Walmet, Schenectady; James C. Corman, and Michael H. McLaughlin, both of Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 18, 1973, Ser. No. 370,838
Int. Cl. H01 *3/00, 5/00*
U.S. Cl. 357—82 **28 Claims**



1. A high pressure-interface-free heat-pipe cooled power semiconductor device assembly comprising

a pressure-interface-free thin integral power semiconductor device-cup member unit including

a power semiconductor device consisting of a body of semiconductor material defined by first and second flat parallel major surfaces,

first and second thin cup-like members having outer bottom surfaces respectively bonded directly to the first and second flat parallel surfaces of the body of semiconductor material so that the integral power semiconductor device-cup member unit is pressure-interface-free, said cup-like members fabricated of a good electrically and thermally conductive material, and

creepage path lengthening means formed along outer side wall portions of said cup-like members for increasing the creepage path across said power semiconductor device, said power semiconductor device defined as developing a thermal density of at least 100 watts per square inch of surface area,

a first long nonwicked gravity-return heat pipe having an evaporating surface end wall in thermal contact with an inner bottom surface of said first cup-like member for removing heat therefrom,

said first nonwicked gravity-return heat pipes comprising

a first enclosed elongated hollow chamber having an evaporator section at a first end thereof respectively defined by the evaporating surface end wall and a condenser section at a second end thereof remote from the first end, and

a two-phase fluid coolant contained within said first chamber and being of sufficient volume in the liquid state to cause full immersion of at least the heated portion of the evaporating surface,

first and second electrical conductors respectively connected to said assembly for supplying electrical power to said power semiconductor device,

a static first thin film of a high thermal and electrical conductivity metal disposed external of said integral semiconductor device-cup member unit between the inner bottom surface of said first cup-like member and evaporating surface end wall of said first heat pipe and in wetting contact therewith and forming a static first thin liquid metal interface therebetween during operation of said semiconductor device, said first thin film of metal of thickness in the range of 1/10 to 5 mils, the thin liquid metal interface not mechanically stressing the thin integral power semiconductor device-cup member unit and the high thermal and electrical conductivity of the liquid metal permitting the cooling of large diameter semiconductor devices without the need for large clamping forces to obtain high pressure joints between said heat pipe and said thin integral power semiconductor device-cup member unit, the close spacing between the first heat pipe and heat-emitting power semiconductor device and lack of pressure interfaces therebetween and in the integral power semiconductor device-cup member unit substantially decreasing the steady-state thermal resistance as well as improving the transient response of the heat-pipe cooled power semiconductor device assembly to obtain improved single-sided cooling of the device without requiring a costly and mechanically complex clamping device, and

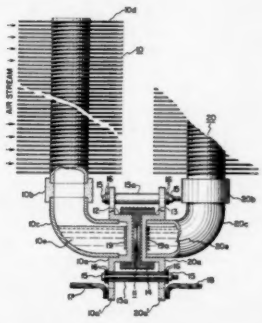
means connected only to the evaporating surface of said first heat pipe for enhancing the evaporating surface so as to increase the rate of heat transfer from the first cup-like member to the fluid coolant in said first heat pipe.

3,852,804

DOUBLE-SIDED HEAT-PIPE COOLED POWER SEMICONDUCTOR DEVICE ASSEMBLY

James C. Corman; Michael H. McLaughlin, both of Scotia, and Gunnar E. Walmet, Schenectady, all of N.Y., assignors to General Electric Co., Schenectady, N.Y.

Filed May 2, 1973, Ser. No. 356,565
Int. Cl. H01 *3/00, 5/00*
U.S. Cl. 357—82 **14 Claims**



1. A heat-pipe cooled power semiconductor device assembly comprising

an integral power semiconductor device unit including a power semiconductor device consisting of a body of semiconductor material defined by first and second flat parallel major surfaces, and first and second support plates having first major surfaces forming interfaces with the first and second flat parallel surfaces of the body of semiconductor material, said support plates fabricated of an electrically conductive high strength material having a coefficient of thermal expansion substantially equal to that of the semiconductor material, said first support plate bonded to said body of semiconductor material along the first surface thereof, said second support plate not being bonded to said body of semiconductor material

but merely in pressure contact therewith to prevent damage to the body of semiconductor material due to stresses that would be induced by the thermal expansions of both support plates and body of semiconductor material when the semiconductor device is operating under normal conditions if both support plates and body of semiconductor material were bonded together, said integral power semiconductor device unit further including first and second cup-like members fabricated of a good thermally and electrically conductive material and having outer bottom surfaces respectively in pressure contact with second major surfaces of said first and second support plates, and creepage path lengthening means formed along side wall portions of said cup-like members for increasing the creepage path across said integral power semiconductor device unit, said power semiconductor device defined as developing a thermal density of at least 100 watts per square inch of surface area,

first and second relatively thin pressure plates having first major surfaces respectively in pressure contact with inner bottom surfaces of said first and second cup-like members,

mean for clamping said first and second pressure plates together to obtain a pressure in the order of 2,000 lbs. per square inch against said semiconductor device and for providing easy removal of said integral power semiconductor device unit from the assembly,

means for connecting a pair of electrical conductors to said assembly or supplying electrical power to said power semiconductor device,

a first long nonwicked gravity-return heat pipe having an open evaporator section end enclosed by and connected to said first pressure plate along a side wall portion thereof, a second major surface of said first pressure plate functioning as a first evaporating surface of the first heat pipe in close proximity to the heat-emitting power semiconductor device for decreasing the steady-state thermal resistance as well as decreasing transient temperature rise for long term heat overloads to obtain improved single-sided vaporization cooling of the device superior to that obtained with conventional finned heat sinks or with wicked heat pipes,

a second long nonwicked gravity-return heat pipe having an open evaporator section end enclosed by and connected to said second pressure plate along a side wall portion thereof, a second major surface of said second pressure plate functioning as a second evaporating surface of the second heat pipe in close proximity to the heat-emitting power semiconductor device to obtain improved double-sided vaporization cooling of the device superior to that obtained with conventional finned heat sinks or with wicked heat pipes, said nonwicked heat pipes being substantially greater in length and having improved cooling characteristics than wicked heat pipes which are limited in length due to wick pumping losses,

said first and second nonwicked gravity-return heat pipes comprise

first and second enclosed elongated hollow chambers having evaporator sections at first ends thereof respectively defined by said first and second pressure plates and condenser sections at seconds ends thereof remote from the first ends,

a two-phase fluid coolant contained within said chambers and being of sufficient volume in the liquid state to cause full immersion of at least the heated portion of the evaporation surface enhancing means in the liquid coolant, and means connected only along the second major surfaces of said first and second pressure plates for enhancing the evaporation surfaces thereof and thereby increasing the rate of heat transfer from the pressure plates to the liquid coolant in the heat pipes which is vaporized,

said clamping means comprising a relatively large diameter threaded connection between said first and second heat pipes,

said large diameter threaded connection comprising

a first collar member joined to the outer surface of a side wall of said first heat pipe adjacent the first end thereof, said first collar being threaded along its outermost surface,

a second collar member joined to the outer surface of a side wall of said second heat pipe adjacent the first end thereof,

a rotatable sleeve member retained along the outer surface of the side wall of said second heat pipe and retained longitudinally therealong by said second collar member, said sleeve member having a projecting portion, and

a U-shaped hollow cylindrical member having a first end portion threaded for mating with the threaded portion of said first collar member, and a second end portion bearing against an outermost side of the projecting portion of said sleeve member, said U-shaped hollow cylindrical member being rotatable in a first direction for applying pressure against said integral power semiconductor device unit, and rotatable in a second direction or easy removal of said integral power semiconductor device unit from the assembly, said large diameter threaded connection providing a high degree of self-alignment of said pressure plates and integral power semiconductor device unit.

3,852,805

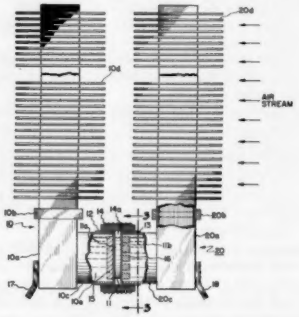
HEAT-PIPE COOLED POWER SEMICONDUCTOR DEVICE ASSEMBLY HAVING INTEGRAL SEMICONDUCTOR DEVICE EVAPORATING SURFACE UNIT

Steven J. Brzozowski, Saratoga, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Filed June 18, 1973, Ser. No. 370,937

Int. Cl. H01 *3/00, 5/00*

U.S. Cl. 357—82 **26 Claims**



1. A high pressure-interface-free heat-pipe cooled power semiconductor device assembly comprising

a pressure-interface free integral power semiconductor device-evaporating surface unit including

a power semiconductor device consisting of a body of semiconductor material defined by first and second flat parallel major surfaces,

first and second thin cup-like members having outer bottom surfaces respectively bonded to the first and second flat parallel surfaces of the body of semiconductor material so that the power semiconductor device-cup like member unit is pressure-interface-free, said cup-like members fabricated of a good electrically and thermally conductive material, and

creepage path lengthening means formed along outer side wall portions of said cup-like members for increasing the creepage path across said power semiconductor device, said power semiconductor device defined as developing

a thermal density of at least 100 watts per square inch of surface area,

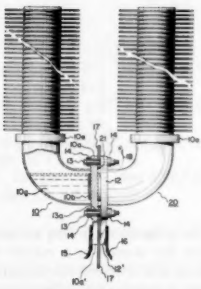
a first long nonwicked gravity-return heat pipe having an open evaporator section end closed by and connected to said first cup-like member along the side wall portion thereof by high pressure-free means, an inner bottom surface of said first cup-like member functioning as an evaporating surface in the evaporator section end of said first heat pipe, said first nonwicked gravity-return heat pipe being substantially greater in length and having improved cooling characteristics than wicked heat pipes which are limited in length due to wick pumping losses, said integral power semiconductor device-evaporating surface unit further including means bonded only along the inner bottom surface of said first cup-like member for enhancing the evaporating surface thereof to thereby increase the rate of heat transfer from the first cup-like member to a liquid coolant in said first heat pipe which becomes vaporized, the close spacing between the evaporating surface and heat-emitting power semiconductor device due to the thinness of said first cup-like member and lack of any pressure interfaces in the integral power semiconductor device-evaporating surface unit substantially decreasing the steady-state thermal resistance as well as improving the transient response of the heat-pipe cooled power semiconductor device assembly to obtain improved single-sided vaporization cooling of the device superior to that obtained with conventional finned heat sink or wicked heat pipe assemblies.

3,852,806

NONWICKED HEAT-PIPE COOLED POWER SEMICONDUCTOR DEVICE ASSEMBLY HAVING ENHANCED EVAPORATED SURFACE HEAT PIPES

James C. Corman; Michael H. McLaughlin, both of Scotia, and Gunnar E. Walmet, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 2, 1973, Ser. No. 356,566
Int. Cl. H01 *3/00, 5/00*
U.S. Cl. 357—82 **12 Claims**



1. A heat-pipe cooled power semiconductor device assembly comprising

a power semiconductor device including a body of semiconductor material defined by first and second flat parallel major surfaces, and first and second support plates having first major surfaces forming interfaces with the first and second flat parallel surfaces of the body of semiconductor material, said support plates fabricated of an electrically conductive high strength material having a coefficient of thermal expansion substantially equal to that of the semiconductor material, said first support plate bonded to said body of semiconductor material along the first surface thereof, said second support plate not being bonded to said body of semiconductor material but merely in pressure contact therewith to prevent damage to the body of semiconductor material due to stresses that would be induced by the thermal expansions of both support plates and body of semiconductor material when the semiconductor device is operating under normal conditions if both support plates and body of semiconductor material were bonded together to form an integral body, said power semiconductor device defined as developing a thermal density of at least **100** watts per square inch of surface area,

first and second relatively thin pressure plates fabricated of a thermally conductive material and having first major surfaces respectively in pressure contact with second major surfaces of said first and second support plates, said pressure plates are each of thickness in the range of 100 to 300 mils,

means for clamping said first and second pressure plates together to obtain a pressure in the order of 2,000 lbs. per square inch against said semiconductor device and for providing easy removal of said power semiconductor device from the assembly,

means for connecting a pair of electrical conductors to said pressure plates for supplying electrical power to said power semiconductor device,

a first long nonwicked gravity-return heat pipe having an open evaporator section end enclosed by and connected to a second major surface of said first pressure plate which functions as an evaporating surface of the first heat pipe in close proximity to the heat-emitting power semiconductor device for decreasing the steady-state thermal resistance as well as decreasing transient temperature rise for long term heat overloads to obtain improved vaporization cooling of the device superior to that obtained with conventional finned heat sinks or with wicked heat pipes, a second long nonwicked gravity-return heat pipe having an open evaporator section end enclosed by and connected to a second major surface of said second pressure plate which functions as an evaporating surface of the second heat pipe in close proximity to the semiconductor device to obtain improved double-sided vaporization cooling of the device,

means connected only along the second major surfaces of said pressure plates for enhancing the evaporation surfaces thereof and thereby increasing the rate of heat transfer from the pressure plates to a liquid coolant in the heat pipes which is vaporized,

said first and second nonwicked gravity-return heat pipes each comprise

an enclosed elongated hollow chamber having an evaporator section at a first end thereof defined by said pressure plates and a condenser section at a second end thereof remote from the first end,

a two-phase fluid coolant contained within each said chamber, the liquid state of the fluid coolant having sufficient volume to cause immersion of at least the heated portion of the evaporation surface enhancing means in the liquid coolant, and

at least a substantial portion of each of said first and second heat pipes being oriented at an angle greater than **0°** with respect to the horizontal.

3,852,807

AUTOMATIC HUE CONTROL CIRCUIT

Gerald L. Caprio, Des Plaines, and Norman W. Parker, Wheaton, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 248,164, April 27, 1972, abandoned. This application Sept. 24, 1973, Ser. No. 399,701
Int. Cl. H04n *9/12*
U.S. Cl. 358—28 **13 Claims**

1. In a color television receiver for receiving a composite signal comprising at least brightness signal components, a subcarrier signal component modulated in phase and amplitude to represent hue and saturation of a color image, and a

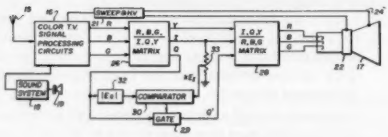
burst component for phase locking the signal of an oscillator of the receiver to control color signal demodulators for the subscriber at different phases of the oscillator output signal, an automatic hue control circuit for controlling hue variations about a predetermined phase of said subcarrier signal component relative to the output signal of the oscillator, said automatic hue control circuit including in combination:

first circuit means responsive to at least the subcarrier component of said composite signal for providing a first demodulated signal at said predetermined phase and having a magnitude corresponding to the magnitude of signals at said predetermined phase;

second circuit means responsive to at least the subcarrier component of said composite signal for producing a first control voltage representative of the absolute magnitude of signals in quadrature with signals at said predetermined phase;

means for supplying said composite signal to said first and second circuit means;

comparator circuit means having first and second inputs and an output;



first coupling means connecting said second circuit means with said first input of said comparator circuit means for applying said first control voltage thereto;

second coupling means connecting said first circuit means with the second input of said comparator circuit means for applying a second control voltage thereto, said second control voltage having a magnitude which has a predetermined value relative to the magnitude of said first demodulated signal;

gating circuit means having a signal input, an output, and a control input and operative to pass signals from the input to the output thereof in response to the application of an enabling signal on the control input thereof;

means for applying said quadrature signals to the input of said gating circuit means;

means coupling the output of said comparator circuit means to the control input of said gating circuit means to apply an enabling signal thereto whenever said first control voltage is greater than said second control voltage; and

means for utilizing the output of said gating circuit means to produce color signals for reproduction by said television receiver.

3,852,808

COLOR AMPLITUDE CORRECTION IN PLURAL TRANSDUCER SIGNAL PLAYBACK SYSTEMS

Koichi Sadashige, Berlin, N.J., assignor to RCA Corporation, New York, N.Y.

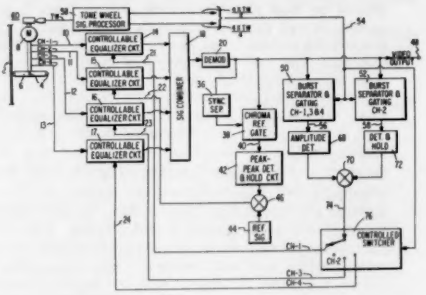
Filed Sept. 10, 1973, Ser. No. 395,735

Claims priority, application Great Britain, Apr. 4, 1973, 16020/73

Int. Cl. H04n *9/02*

U.S. Cl. 358—8 **5 Claims**

1. In a system for correcting chroma amplitude errors in a signal recovered from a record medium by sequential scan of a plurality of transducers, wherein the signal includes color burst portions and a color amplitude reference signal portion, said system having playback circuitry including means for varying its response to said signal in accordance with an error signal applied thereto, the combination comprising: means providing a first error signal in accordance with a difference of said reference signal portion and a norm, means applying said first error signal to said response varying means in said playback circuitry, means for comparing said burst signal



portions as recovered from a given one of said scanning transducers with that of a further transducer to provide a second error signal, and means for applying said second error signal to said response varying means in said playback circuitry.

3,852,809

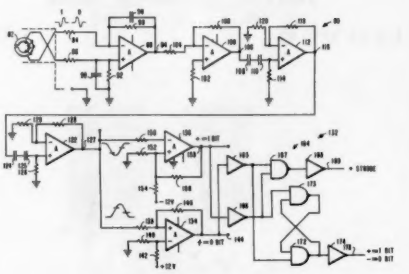
RETURN TO ZERO DETECTION CIRCUIT FOR VARIABLE DATA RATE SCANNING

Charles Walter Coker, Jr., Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 5, 1973, Ser. No. 376,620

Int. Cl. G11b *5/02*

U.S. Cl. 360—40 **10 Claims**

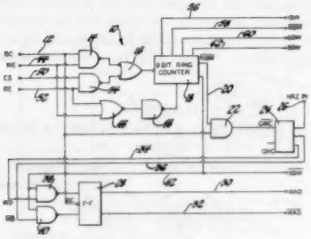


1. For use in a digital recording system wherein binary bits of information are stored in a return to zero format by a storage medium and wherein translational motion between a read head and the storage medium causes the read head to generate successive initial and subsequent distinguishable electric signals having a relative nature dependent upon the information content of a binary bit being read, a self-clocking information detection circuit connected to receive the electric signals from the read head, the detection circuit comprising an integrator connected to receive a read head electric signal and generate an integrated read head electric signal as an output; first and second detectors connected to detect positive and negative pulses respectively on the integrated read head electric signal, each detector including circuitry for initiating a predetermined detector output signal when a pulse of a polarity to which the detector is responsive exceeds a first predetermined magnitude and terminating a detector output pulse only when the pulse magniude is less than a second predetermined magnitude which is less than the first predetermined magnitude.

3,852,810
SELF-CLOCKING NRZ RECORDING AND REPRODUCTION SYSTEM

Ronald P. McGrath, Livonia, and William A. Bleher, Detroit, both of Mich., assignors to General Instrument Corporation, New York, N.Y.

Filed Mar. 17, 1972, Ser. No. 235,583
Int. Cl. G11b *5/02*
U.S. Cl. 360—51 **3 Claims**



1. In a system for storing and retrieving data in a magnetic medium according to a binary code wherein first and second data quantities are represented by first and second discrete flux conditions in the medium; data writing means responsive to input data to produce a substantially continuous data pattern in the medium at a clocked rate thereby to produce a sequence of data cells each having a discrete flux condition; means operatively associated with said writing means for interrupting the data pattern after every n cells and inserting a sync cell having a flux condition which is opposite to the flux condition of the preceding cell; data reading means responsive to said flux conditions for producing output representative thereof and at a rate corresponding to said clock rate thereby to define discrete data bits corresponding to said data cells; and synchronizing means including a clock source operatively associated with said reading means for timing the reading of said flux conditions, said synchronizing means including means for resetting the clock source after the reading of said sync cell flux condition; and means responsive to the flux transitions in the data cells immediately proximate the sync cell for adjusting the timing of said clock source to compen sate for sync cell shifting due to pulse crowding.

3,852,811
DIGITAL DATA ENCODING AND RECONSTRUCTION CIRCUIT

Shirzad Aghazadeh, Burbank, Calif., assignor to The Singer Company, New York, N.Y.

Filed Apr. 10, 1974, Ser. No. 459,520
Int. Cl. G11b *5/09*
U.S. Cl. 360—51 **4 Claims**

1. In a digital recording and reconstruction circuit of the type comprising:

gating means responsive to a master clock signal and a binary data input signal for generating a first alternating signal having a cycle of one phase representing a binary "1" and a cycle of the opposite phase representing a binary "0;"

dividing means coupled to said gating means and responsive to said first alternating signal for generating a second alternating signal having a frequency of one-half that of said first alternating signal;

said second alternating signal having midbit transitions representing a binary "1," and transitions at the beginning of bits between contiguous binary "0's" of the input signal representing a binary "0;"

recording means for recording and for reading and shaping said second alternate signal;

an edge detector coupled to the output of said recording means and responsive to said second alternate signal for producing data spike signals at points corresponding in time to the edges of said shaped second alternate signal;

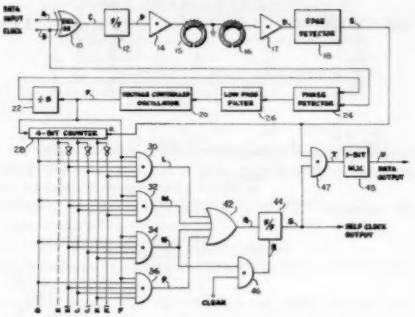
clock circuitry coupled to said edge detector and responsive to the data spike signals for generating a self-clocking signal having a frequency corresponding to said master clock signal;

gating circuitry coupled to said clock circuitry and to said edge detector for producing output spike signals when the polarity of said self-clocking signal corresponds to that of the data spike signals; and

pulse generating means coupled to said gating circuitry for generating output pulses of one bit in width upon receipt of each output spike signal;

the improvement being in the said clock circuitry which comprises:

generating means for producing recurring pulses at a



frequency that is a multiple of said master clock signal frequency;

a binary counter coupled to said generating means for producing output signals having pulse widths that are twice, four times, eight times, and sixteen times the width of the pulses produced by said generating means;

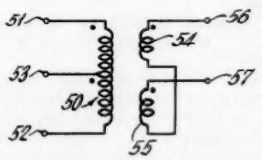
gating means coupled to receive selected output signals from said binary counter and the recurring pulses from said generating means for producing output pulses having widths of one-quarter, three-quarters, one and one-quarter, and one and three-quarters of one cycle of said master clock signal; and

a flip-flop coupled to the output of said gating means said flip-flop adapted to change state upon the arrival of each output signal from said gating means for generating a substantially square wave clocking signal corresponding to said master clock signal.

3,852,812
SYMMETRICAL DIRECT CURRENT TUNNEL ERASING

Frederick Reisfeld, Commack, N.Y., assignor to Potter Instrument Company, Inc., Melville, N.Y.

Filed July 25, 1973, Ser. No. 382,417
Int. Cl. G11b *5/02, 5/20, 5/47*
U.S. Cl. 360—66 **5 Claims**



1. In a magnetic transducer head of the type having a first magnetic core with a gap defining the width of a magnetic

track to be recorded, a read/write coil on said first magnetic core, second and third magnetic cores having gaps positioned to erase opposite sides of said magnetic track, and erase coils on said second and third cores; the improvement comprising means for direct current energizing said erase coils and means interconnecting said energizing means and said erase coils for producing magnetic fields of opposite polarity at the respective gaps of said cores with respect to the lengthwise direction of said magnetic track.

3,852,813

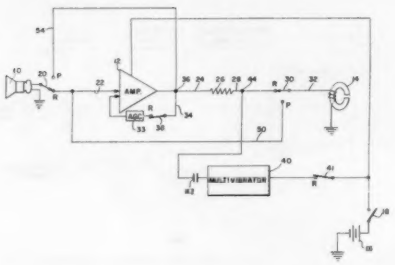
METHOD AND CIRCUIT FOR RECORDING AUDIO SIGNALS ON MAGNETIC TAPE

Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 44,441, June 8, 1970, abandoned. This application Sept. 11, 1972, Ser. No. 288,147

Int. Cl. G11b *5/02, 5/44*

U.S. Cl. 360—66 **5 Claims**



1. Recording apparatus of a low package volume variety comprising:

speaker-microphone means having a record mode for receiving an audio signal and having an output corresponding thereto; amplifier means connected to said speaker-microphone for amplifying said output; means coupled between the input and output of said amplifier means providing automatic gain control over said amplifier means when said speaker-microphone is in said record mode; free-running multivibrator means having an output generating a bias signal having a repeating, symmetrical, substantially rectangular wave form; a magnetic recording head; circuit means for amplitude summing said bias signal with said amplified output and applying said summated signal to said recording head, said bias signal being selected to cause said audio signal to be recorded linearly.

3,852,814

MAGNETIC TAPE RECORDING AND/OR REPRODUCING APPARATUS HAVING MEANS TO RELOCATE A PREVIOUS TERMINATION OF RECORDING OR REPRODUCING

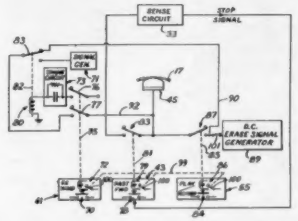
Delmar R. Johnson, Barrington, Ill., and Rickard J. Elkus, Jr., Atherton, Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Oct. 31, 1972, Ser. No. 302,517

Int. Cl. G11b *15/02, 19/18*

U.S. Cl. 360—72 **8 Claims**

1. An apparatus for automatically marking a spot on a magnetic tape at termination of a playback or recording operation and for subsequently transporting at high speed and returning the magnetic tape at high speed to this spot for resumption of recording and/or reproducing at low speed, said apparatus comprising means carrying a coil of magnetic tape, a transducer means past which said magnetic tape travels for a playback or recording operation, a tape transport means for transporting said tape past said transducer means at a first predetermined low speed and at a second predetermined high speed, play/record selector means for operating said tape transport means to feed said tape in a forward direction at said first predetermined speed and for causing a playback or recording operation a manually operable fast forward selector means for operating said tape transport means to transport said tape in a forward direction at said said predetermined speed substantially faster than said first predetermined speed, a manually operable rewind selector means for operating said tape transport means to transport said tape in reverse direction at said second predetermined speed, means for recording activated upon operation of one of said fast forward or rewind selector means for forming a location signal on said magnetic tape at the spot of termination of a playback or recording operation, and sensing means activated by manual operation of the other one of said fast forward or rewind selector means causing tape transport at said high speed for sensing said location signal and for terminating said high speed tape transport so that playback or recording may be resumed at the proximate location of the last playback or recording operation.



3,852,815

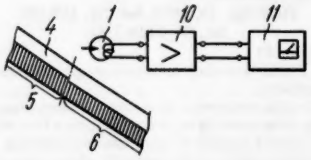
METHOD OF CHECKING THE POSITION OF A MAGNETIC HEAD RELATIVE TO A MAGNETIC RECORDING MEDIUM AND A TEST MAGNET RECORDING MEDIUM FOR EFFECTING SAID METHOD

Mark Lipovich Ljudmirsky, Bulvar Druzhby narodov, 14, kv. 4; Georgy Mironovich Forshtator, ulitsa kropivnitskogo, 14, kv. 4, and Yakov Solomonovich Shkurovich, ulitsa Cheljuskintsev, 8, kv. 24, all of Kiev, U.S.S.R.

Filed Apr. 11, 1973, Ser. No. 350,023

Int. Cl. G11b *5/46, 27/34*

U.S. Cl. 360—75 **2 Claims**



1. A method of checking the position of a magnetic head relative to a magnetic recording medium, said method comprising the steps of:

recording a test signal pattern having two sections with mutually displaced recording tracks on the magnetic recording medium, said tracks being disposed on the magnetic recording medium so that the bottom edge of the recording track of one of the two sections is aligned with the bottom edge of the recording medium and so that the top edge thereof is positioned at a minimum allowable distance *a* from the top edge of the recording

medium, the bottom edge of the recording track of the other section being also aligned with the bottom edge of the magnetic recording medium and the top edge thereof being positioned at a maximum allowable distance *b* from the top edge of the magnetic recording medium;

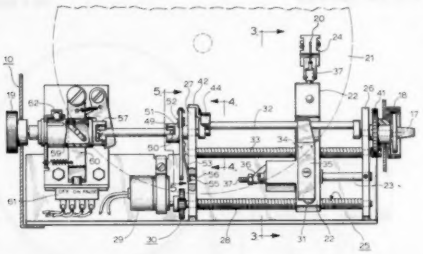
reproducing successively both sections of the test signal pattern so as to determine the output of the magnetic head; and

producing an output only from the section of the test signal pattern whereon the top edge of the recording track is positioned at the minimum allowable distance from the top edge of the magnetic recording medium in order to indicate that the magnetic head is in the required position.

3,852,816
CARRIAGE ASSEMBLY FOR A VIDEO DISC PLAYBACK DECK

David S. Stewart, Palatine, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 1, 1972, Ser. No. 277,074
Int. Cl. G11b *5/52*
U.S. Cl. 360—86 **4 Claims**



1. A carriage assembly for advancing a pickup element over an independently driven rotating information storage disc containing a spiral modulation track comprising: a carriage supporting said pickup element adjacent the surface of said disc;

a frame;

carriage support means for supporting said carriage on said frame for travel along a path parallel to the surface of said disc;

motor driven carriage advancing means comprising a first lead screw rotatably journalled on said frame for rotation about an axis parallel to said carriage travel path for propelling said pickup element across the surface of said disc at a velocity proportional to the radial progression of the rotating spiral track;

user actuated carriage positioning means comprising a rotatable control and a second lead screw also rotatably journalled on said frame for rotation about an axis parallel to said carriage travel path for manually positioning said pickup to a desired location along said spiral track in response to rotation of said control;

selector means coupled to said carriage for selectively engaging said carriage with either said motor driven lead screw or said user actuated lead screw;

first and second followers individually engageable, respectively, with said carriage advancing lead screw and said carriage positioning lead screw; and

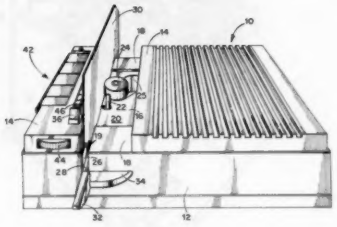
means for pivotally mounting said carriage on said carriage support means for displacement, in response to actuation of said selector, between an operating position in which said first follower engages said carriage advancing lead screw and said pickup is presented to said track for sensing modulation thereon, and

a retracted position in which said second follower engages said carriage positioning lead screw as said pickup is withdrawn from presentation to said track.

3,852,817
COMBINATION CARD AND TAPE RECORDER

Charles R. Budrose, 127 Country Club Rd., Melrose, Mass. 02176

Continuation-in-part of Ser. No. 273,441, July 20, 1972,. This application Oct. 16, 1972, Ser. No. 297,947
Int. Cl. G11b *5/00, 15/60, 19/20*
U.S. Cl. 360—88 **15 Claims**



1. An audio recording and reproducing machine capable of handling either a tape cassette or card having a magnetic media associated therewith comprising:

a housing having means defining a well for receiving the tape cassette;

means for driving the tape in the cassette;

said housing defining a guide channel having a track for said card to pass along;

means for driving said card through the guide channel, said housing defining an opening for receiving said card driving means;

manually operable means for selecting either the card or tape mode of operation;

and mode selection means responsive to said manually operable means being in the tape mode of operation for maintaining said card drive means in said opening and enabling said tape drive means, and responsive to said manually operable means being in the card mode of operation for moving said card drive means out of said opening adjacent to said channel and disabling said tape drive means.

3,852,818
TAPE CARTRIDGE PLAYER MECHANISM

Gerald Dee Pyles, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 17, 1971, Ser. No. 199,482
Int. Cl. G11b *21/10, 23/12*
U.S. Cl. 360—92 **18 Claims**

1. In a tape cartridge player of the type having tape playing mechanisms including a movable transducer assembly adapted to be positioned to scan across different tracks of a cartridge tape, a structure comprising:

a plurality of cartridge receptacles each adapted to receive a tape cartridge which is positionable in said receptacle in a first position out of engagement with portions of the tape playing mechanism of said player and in a second position in operative engagement with said portions of said tape playing mechanism;

drive means providing a source of mechanical power;

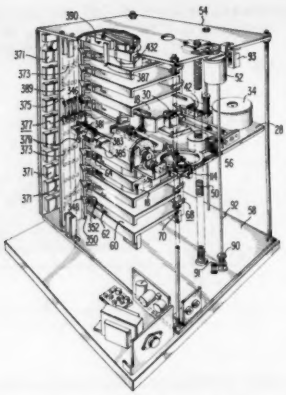
means mounting said drive means for movement between respective ones of said cartridge receptacles;

first means for moving the tape cartridge between said first and said second positions;

second means for moving said transducer assembly to position said transducer assembly to scan across the different tracks of the cartridge tape; and

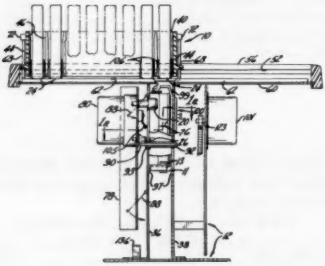
cycling means supported on said means mounting said drive

means for movement between respective ones of said cartridge receptacles and coupled to said drive means to



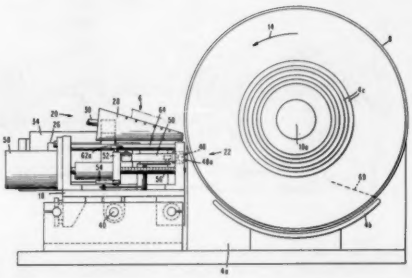
provide controlled movement of said first and second means.

3,852,819
AUTOMATIC CHANGER FOR CASSETTE PLAYER-RECORDER
Theophiel Clement Jozef Lodewijk Staar, Kraainem, Belgium, assignor to S. A. Staar, Brussels, Belgium
Filed Apr. 10, 1968, Ser. No. 720,236
Claims priority, application Belgium, June 15, 1967, 44973
Int. Cl. G11b *5/00, 23/04*
U.S. Cl. 360—92 **44 Claims**



1. In a cassette player-recorder equipped with an automatic changer and having a magazine for storing a plurality of cassettes each having openings for introduction of tape transport elements within the cassette, said magazine being movable to locate a cassette stored therein for transfer in a downward direction to a playing position, the combination comprising, guide means for constraining the movement of a cassette received from said magazine to a single vertical plane to and from its playing position, a tape transport movably mounted adjacent said guide means for movement downward and toward said guide means by gravity and carrying tape and reel drive elements adapted upon such movement of said tape transport to be introduced into the openings of a cassette while said cassette is being lowered by gravity to operatively engage elements within the cassette, and means connected to said tape transport for supporting a cassette in said guide means and movable downward with said tape transport to lower said cassette by gravity along said guide means to its playing position.

3,852,820
STABILIZATION OF PARTITIONABLE MEMORY WITH FLEXIBLE ROTATING DISCS
Raymond A. Barbeau; Bernard W. McGinnis, and Frederick A. Schultz, all of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed July 2, 1973, Ser. No. 375,988
Int. Cl. G11b *15/00*
U.S. Cl. 360—99 **16 Claims**



1. In a random access laminar disc file array, wherein rotating flexible discs in a laminar aggregate configuration are separated for transducing access by movement of a partitioning mechanism into a randomly selected interface between discs causing deformation of the path of rotation of a randomly selected segment of the laminar aggregate, improved stabilizing means comprising:

flexible motion stabilizing means connected to one axial end of the aggregate and subject to rotation and deformation with said segments upon operation of said partitioning mechanism;

rigid means positioned at the other axial end of the aggregate, opposite said one end, for maintaining a constant rotational reference for complementary disc segments whose rotational paths are undisturbed by the partitioning mechanism;

means bounding a portion of the circumferential path of revolution of the partitioned aggregate for reducing turbulence at said selected interface due to operation of said partitioning mechanism; and

means incorporated in said partitioning mechanism for augmenting the airflow within the partitioned interface to stabilize the motion of the discs in the said complementary segments during operations of the partitioning mechanism.

DESIGN PATENTS

GRANTED DECEMBER 3, 1974

ERRATA

For CLASS	See PATENT NO.
D10–123	D233,851

DESIGNS

DECEMBER 3, 1974

233,805
WRESTLING SHOE
Takeshi Kubo, Kobe, Japan, % Design Room Modefic 1–18, 6-chome
Filed Mar. 19, 1973, Ser. No. 342,366
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

233,806
BRUSH
Hiroshi Hukuba, Nagareyama, Japan, assignor to Kabushiki Kaisha Hukuba Future Research, Nagareyama, Japan
Filed July 27, 1973, Ser. No. 383,400
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—12

233,807
CHAIR OR SIMILAR ARTICLE
Fred Ruf, Arlesheim, Switzerland, assignor to Giroflex-Entwicklungs-AG, Koblenz, Switzerland
Filed Dec. 11, 1972, Ser. No. 313,948
Claims priority, application Switzerland June 29, 1972
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

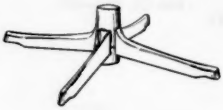
233,808
CHAIR OR SIMILAR ARTICLE
Fred Ruf, Arlesheim, Switzerland, assignor to Giroflex-Entwicklungs-AG, Koblenz, Switzerland
Filed Dec. 11, 1972, Ser. No. 313,951
Claims priority, application Switzerland June 29, 1972
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

233,809
CHAIR
Warren Platner, New Haven, Conn., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Mar. 26, 1973, Ser. No. 344,850
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

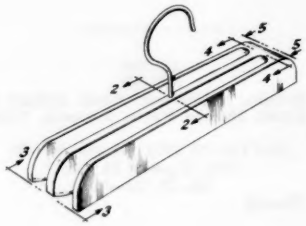
233,810
RECLINING LOUNGE CHAIR
Tim M. Uyeda, South San Gabriel, Calif., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 2, 1973, Ser. No. 337,462
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38

233,811
CHAIR
Akihiko Noda, and Akira Hirose, Tokyo, Japan, assignors to France Bed Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1973, Ser. No. 336,500
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—76

233,812
CHAIR BASE
Warren Platner, 18 Mitchell Drive, New Haven, Conn. 06511
Filed Mar. 26, 1973, Ser. No. 344,852
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196



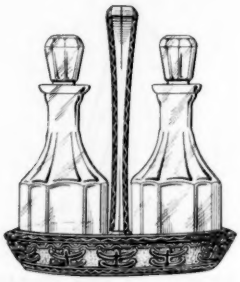
233,813
TROUSER HANGER
Bernard Shyffer, 4212 Palos Verdes Drive E., Miraleste, Calif. 90732
Filed Feb. 12, 1973, Ser. No. 331,364
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—247



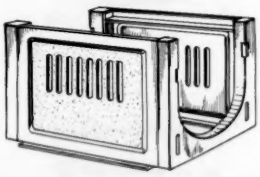
233,814
GRATED CHEESE BOWL
Augusto Salviate, Corso Mario Abbiate, 110, Vercelli, Italy
Filed June 11, 1973, Ser. No. 369,050
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—17

233,815
COMBINED SET OF CONDIMENT JARS AND TRAY THEREFOR
Augusto Salviato, Corso Mario Abbiate, 110, Vercelli, Italy
Filed June 11, 1973, Ser. No. 369,026
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—52

233,816
COMBINED CRUET SET AND TRAY THEREFOR
Augusto Salviato, Corso Mario Abbiate, 110, Vercelli, Italy
Filed June 11, 1973, Ser. No. 368,892
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—58



233,817
WINE RACK
Ralph James Mathews, Stanmore, and Alan Ernest Clifford, London, England, assignors to British Oxygen Company Limited, London, England
Filed Sept. 26, 1972, Ser. No. 293,853
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D7—70

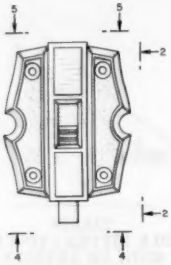


233,818
BRUSH CLEANER
Hiroshi Hukuba, 2–320–82 Matsugaoka, Nagareyama, Japan
Filed June 4, 1973, Ser. No. 366,660
Claims priority, application Japan Dec. 6, 1972
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—181

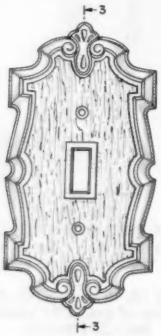
233,819
DISPOSABLE LITTER CONTAINER OR SIMILAR ARTICLE
Sidney Biderman, 5524 E. Utah Place, Denver, Colo. 80222
Filed July 3, 1972, Ser. No. 268,699
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—193

233,820
CORDLESS ELECTRIC UPRIGHT GRASS SHEAR
William E. Bartasevich, Jr., Glenshaw, and James E. Edgell, Bradford Woods, Pa., assignors to Disston Inc., Pittsburgh, Pa.
Filed July 16, 1973, Ser. No. 379,380
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8

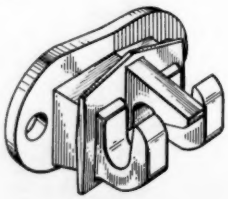
233,821
DECORATIVE SLIDE BOLT
Roger Dahl and David R. Crouch, Los Angeles, Calif., assignors to Ajax Hardware Corporation, City of Industry, Calif.
Filed June 28, 1973, Ser. No. 374,493
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—131



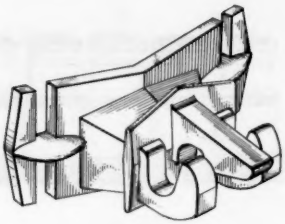
233,822
SWITCH PLATE
David P. Zagaroli, Hickory, N.C., assignor to Ajax Hardware Corporation, City of Industry, Calif.
Filed Mar. 14, 1973, Ser. No. 341,022
Term of patent 14 years
Int. Cl. D13—*99;* D8—*99*
U.S. Cl. D8—181



233,823
ELECTRIC FENCE INSULATOR
Howard Langlie and Albert T. Berg, Jr., both of Ellendale, Minn. 56026
Filed July 31, 1972, Ser. No. 276,551
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D8—230

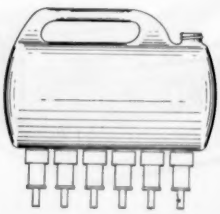


233,824
ELECTRIC FENCE INSULATOR
Albert T. Berg, Jr., and Howard Langlie, both of Ellendale, Minn. 56026
Filed July 31, 1972, Ser. No. 276,552
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D8—230



233,825
BOTTLE
Keith N. Thomas, Los Angeles, Calif., assignor to Purex Corporation, Ltd., Lakewood, Calif.
Filed Nov. 15, 1972, Ser. No. 306,861
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—41

233,826
BATTERY WATER DISPENSER
Robert W. Olsen, Hinsdale, Ill., assignor to Efficiency Dispensers Corporation
Filed June 18, 1973, Ser. No. 371,279
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—53

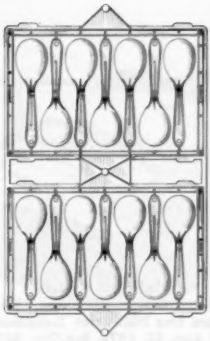


233,827
BOTTLE
Misdrahi Henry, 71 Blvd. Brune, Paris, France 75014
Filed May 21, 1973, Ser. No. 361,867
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—71

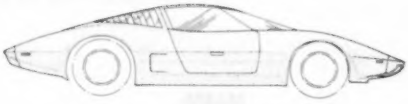
233,828
BOTTLE
Donald J. Leary, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Apr. 9, 1973, Ser. No. 349,117
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—160

233,829
JAR OR SIMILAR ARTICLE
Sara L. Balbach, New York, and Richard W. Greger, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Original design application July 20, 1970, Ser. No. 24,040, now Patent No. 225,309. Divided and this application Sept. 27, 1971, Ser. No. 184,334
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—164

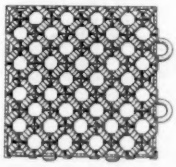
233,830
PACKAGE OF SPOONS OR THE LIKE
Samuel R. Davis, Jr., and Harry A. Watson, Federalsburg, Md., assignors to Maryland Plastics Incorporated, Federalsburg, Md.
Filed Sept. 13, 1972, Ser. No. 288,696
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—193



233,831
AUTOMOBILE BODY
Henry G. Haga, Bloomfield Hills, Charles M. Jordan, Franklin, William L. Mitchell, Bloomfield Hills, and Jerry P. Palmer, Royal Oak, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Dec. 26, 1973, Ser. No. 427,850
Term of patent 7 years
Int. Cl. D12—*08*
U.S. Cl. D12—91

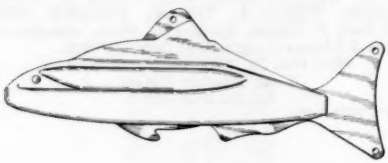


233,832
TENNIS COURT FLOORING UNIT OR THE LIKE
Jean Becker, 13 Avenue de la Gare, Soissons, France
Filed July 25, 1972, Ser. No. 274,866
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 J



233,833
FISHING LURE
Harley E. Warrick, General Delivery, Stratton, Ohio 43961
Continuation-in-part of abandoned application Ser. No. 259,365, June 2, 1972. This application May 31, 1973, Ser. No. 365,694
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

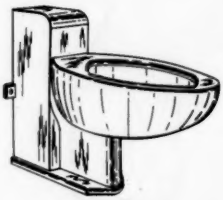
233,834
FISHING LURE
Douglas W. Swanningson, Kenosha, Wis., assignor to Swannee Dee Industries, Kenosha, Wis.
Filed Apr. 23, 1974, Ser. No. 463,357
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



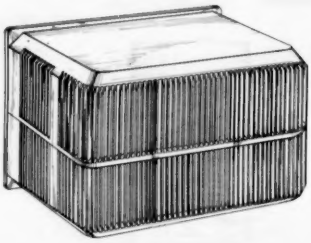
233,835
ROTARY LAWN SPRINKLER
Jean O. Reinecke, Pasadena, Calif., assignor to Rain Bird Sprinkler Mfg. Co., Glendora, Calif.
Filed May 3, 1973, Ser. No. 357,033
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7

233,836
SAFETY VALVE
Dieter Raffler and Franco Clivio, Ulm, Germany, assignors to Messrs. Kupex AG, Glarus, Switzerland
Filed July 12, 1972, Ser. No. 271,062
Claims priority, application Germany Jan. 18, 1972
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

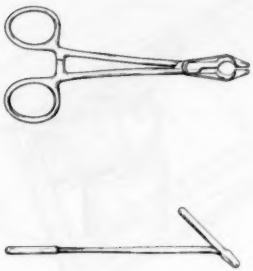
233,837
WATER CLOSET
George Vincent Brady, Philadelphia, Pa., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Jan. 22, 1973, Ser. No. 325,535
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—67



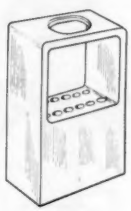
233,838
ROOM AIR CONDITIONER OUTER CASE OR SIMILAR ARTICLE
Walter Baker, Jr., Louisville, Ky., assignor to General Electric Company
Filed July 30, 1973, Ser. No. 383,812
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—141



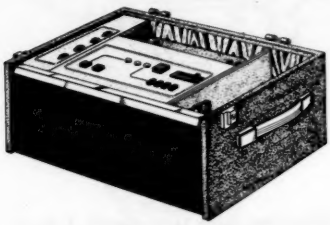
233,839
COMBINED DENTAL FORCEPS AND PROTECTIVE TONG COVER THEREFOR
Norman E. Royse, 2140 Shattuck Ave., Oakland, Calif. 94704
Filed Oct. 2, 1972, Ser. No. 297,765
Term of patent 14 years
Int. Cl. D24—*02*; D8—*03*
U.S. Cl. D24—1 D



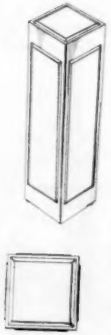
233,840
ELECTRICAL CONTACT CONNECTOR
Ralph R. Hensley, Gahanna, and Earl Graham, Jr., Whitehall, Ohio, assignors to Twyco, Inc., Blacklick, Ohio
Filed Nov. 10, 1972, Ser. No. 305,456
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D26—1 A



233,841
MAGNETIC TAPE PLAYER
David V. Charlesworth, Seaford, and John Grey, London, England, assignors to Clarke & Smith Manufacturing Company Limited, Wallington, Surrey, England
Filed Nov. 22, 1972, Ser. No. 308,727
Claims priority, application Great Britain May 25, 1972
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B



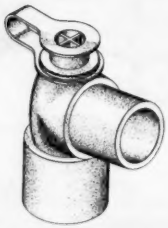
233,842
ENCLOSURE FOR HIGH FIDELITY LOUDSPEAKER SYSTEM
Michael L. Petroff, Los Angeles, Calif., assignor to Equasound Corporation, Los Angeles, Calif.
Filed Feb. 23, 1973, Ser. No. 335,428
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G



233,843
FACSIMILE TRANSCEIVER
William Lansing Plumb, New York, N.Y., assignor to Rapifax Corporation, Valhalla, N.Y.
Filed June 11, 1973, Ser. No. 369,122
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 R

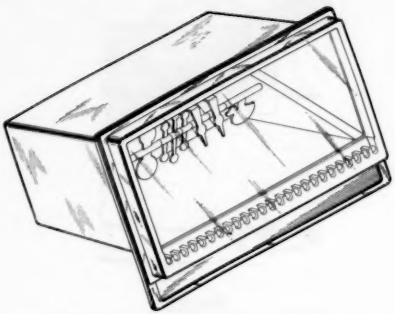
233,844
CAT PERCH AND EXERCISE POLE
Guy W. Tucker, Littleton, Colo., assignor to The Rotuc Corporation, Windsor, Colo.
Filed June 22, 1972, Ser. No. 265,189
Term of patent 14 years
Int. Cl. D30—*07*
U.S. Cl. D30—42

233,845
SWIVEL CONNECTOR FOR MEDICAL ADMINISTRATION EQUIPMENT
Bruce E. Fettel, Diamond Bar, and Samuel Burd, Long Beach, Calif., assignors to Shiley Laboratories, Inc., Santa Ana, Calif.
Filed Mar. 15, 1973, Ser. No. 341,382
Term of patent 14 years
Int. Cl. D24—*04;* D24—*99*
U.S. Cl. D32—1 R

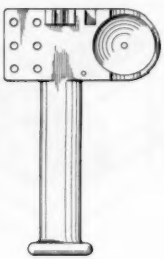


233,846
DOLL OR SIMILAR ARTICLE
Marie Leavitt, 85 Free St., Hingham, Mass. 02043
Filed Aug. 30, 1973, Ser. No. 393,047
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 C

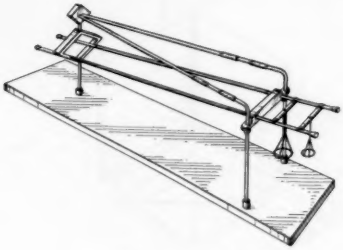
233,847
TOY SHOOTING GALLERY
Raymond J. Lohr and Martin Condry, Erie, Mahlon E. Hirsch, Fairview, and Laurie Jay Campbell and Maxmillian P. Rogers, Erie, Pa., assignors to Louis Marx & Co., Inc.
Filed May 29, 1973, Ser. No. 364,578
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PP



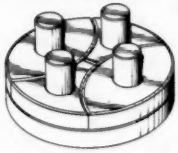
233,848
GOLF ACCESSORY HOLDER
Raymond J. Gotliebowski, 5192 Haverford Drive, Lyndhurst, Ohio 44124
Filed July 2, 1973, Ser. No. 375,735
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB



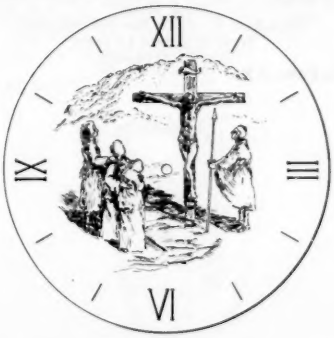
233,849
NOVELTY TRACKWAY FOR GRAVITY-DEFYING ROLLING CONE
Jerome Cohen, 178 N. Pleasant Ave., Ridgewood, N.J. 07450
Filed Mar. 30, 1971, Ser. No. 129,656
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 K



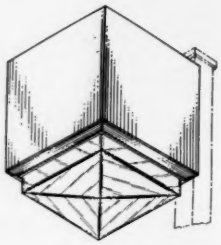
233,850
PUZZLE
Lloyd A. Nielsen, 4441 South Avenue W., Missoula, Mont. 59801
Filed Mar. 30, 1973, Ser. No. 346,601
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



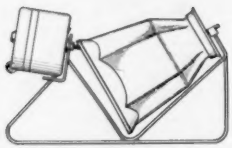
233,851
WATCH FACE
Alex Luna Miramon, 9465 Wilshire Blvd., Beverly Hills, Calif. 90212
Filed Apr. 5, 1973, Ser. No. 348,335
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—123



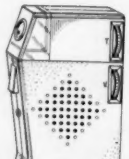
233,852
LUMINAIRE
Russell A. Czellath, Brook Park, and Donald E. Husby, Fairview Park, Ohio, assignors to Westinghouse Electric Corporation
Filed Oct. 6, 1972, Ser. No. 295,618
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



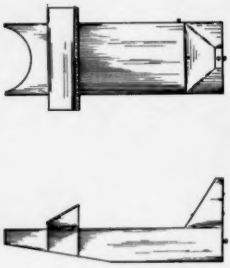
233,853
TUMBLER FOR GEM STONES
Joseph A. Ferrara, 2809 Industrial Parkway, Santa Maria, Calif. 93454
Filed Sept. 5, 1972, Ser. No. 286,829
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D55—1 D



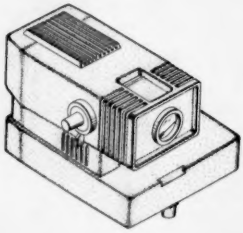
233,854
COMBINED POCKET RADIO AND FLASHLIGHT
Gilbert Y. Y. Yue, 320 Ma Tau Wei, 2nd Floor Hong Kong
Filed May 16, 1973, Ser. No. 360,691
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



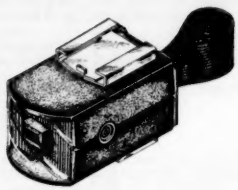
233,855
IDENTIFICATION PHOTOGRAPHY JIG
Ronald E. Mertens and Frank W. Davis, Indianapolis, Ind., assignors to Photo Communications, Inc., Indianapolis, Ind.
Filed Apr. 25, 1973, Ser. No. 354,233
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D61—1 E



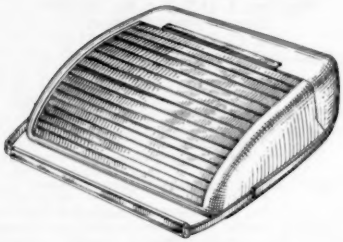
233,856
FILM STRIP PROJECTOR
Hiroshi Kira, Oxnard, Calif., assignor to Norman Holtzman, Los Angeles, Calif.
Filed June 18, 1973, Ser. No. 371,283
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 J

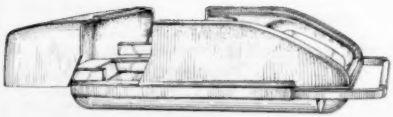


233,857
PHOTOGRAPHIC FLASHLIGHT SLAVE TRIGGERING UNIT
Peter T. Quinn, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Filed June 28, 1973, Ser. No. 374,560
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 F

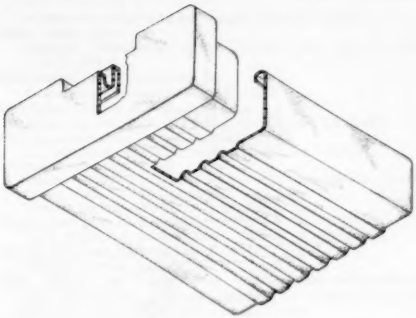


233,858
TYPEWRITER HOUSING WITH TAMBOUR COVER
Karl T. Baughman, Lake Forest, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed June 7, 1973, Ser. No. 367,808
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A



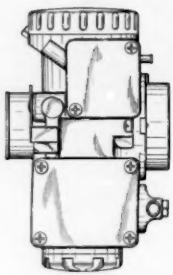


233,859
DRAWER
Charles R. Tyke, Lexington, Ohio and William C. Anderson, Grand Rapids, Mich., assignors to Westinghouse Electric Corporation
Filed Apr. 3, 1973, Ser. No. 347,512
Term of patent 14 years
Int. Cl. D15—*07*; D6—*06*
U.S. Cl. D67—3 B

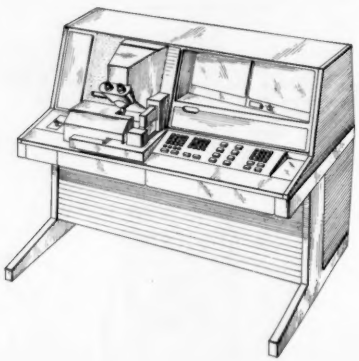


233,860
CANDLE
Vaughn G. Evans, and Laura A. Evans, both of 4016 Redbridge Road, Kansas City, Mo. 64106
Filed Oct. 26, 1971, Ser. No. 192,701
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D73—1

233,861
CARBURETTOR BODY
Geoffrey Hartshorne, Shenstone, England, assignor to AMAL Limited, Birmingham, Warwickshire, England
Filed June 27, 1972, Ser. No. 266,730
Claims priority, application Great Britain Jan. 5, 1972
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1 A

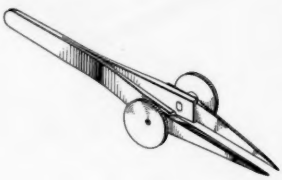


233,862
BLOOD CELL ANALYZER OR SIMILAR ARTICLE
John Russell Nelson, Natick, Mass., David Edward Roche, Nashua, N.H., and Joseph John Montagna, Acton, Mass., assignors to Coulter Electronics Inc., Hialeah, Fla.
Filed Oct. 18, 1973, Ser. No. 407,535
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 F



233,863
WATER PIPE
Helmut Keidl, 2344 N. 57th St., Milwaukee, Wis. 53210, and Rick A. Lemke, Milwaukee, Wis. (18060 Lamp Lighter Lane, Brookfield, Wis. 53005)
Filed May 11, 1972, Ser. No. 252,542
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D85—8 A

233,864
TWEEZER OR SIMILAR ARTICLE
Edgar M. McClure, Roanoke, Va., assignor to Scientific Components, Inc., Roanoke, Va.
Filed Jan. 3, 1973, Ser. No. 320,816
Term of patent 14 years
Int. Cl. D8—*05;* D24—*02*
U.S. Cl. D86—10 B



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3D DAY OF DECEMBER, 1974

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio Noormarkku: *See—*
Lindberg, Martin, 3,852,108.

A/S Ardal og Sunndal Verk: *See—*
Aarflot, Aksel Ola; Rudi, Fred; Sorensen, Gunnar Birger; Alvsaker, Bjarne; and Berg, Otto, 3,852,122.

AAI Corporation: *See—*
La Costa, Nicholas Joseph, 3,851,590.

Aarflot, Aksel Ola; Rudi, Fred; Sorensen, Gunnar Birger; Alvsaker, Bjarne; and Berg, Otto, to A/S Ardal og Sunndal Verk. Method of producing a weldable and ageable aluminium alloy of great strength and product. 3,852,122, Cl. 148-3.000.

AB Nynas-Petroleum: *See—*
Brisman, Sven Brynolf, 3,851,438.

Abbott Laboratories: *See—*
Prasad, Raj Nandan; and Stein, Herman Hal, 3,852,268.

Aberg, Bertil, to Allmanna Svenska Elektriska Aktiebolaget. Method for hydrostatic extrusion. 3,851,511, Cl. 72-60.000.

Aberth, William H., to Stanford Research Institute. Multipoint field ionization source. 3,852,595, Cl. 250-288.000.

Abramitis, Walter W.: *See—*
Reck, Richard A.; and Abramitis, Walter W., 3,852,340.

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Acosta, Armando E., to Mortinson, Abner J. Foldable golf practice swing apparatus. 3,851,886, Cl. 273-197.00a.

Adalbert, Gerhard; Hess, Jurgen; and Linder, Ernst, to Bosch, Robert, G.m.b.H. Pressure-sealed compressor. 3,852,003, Cl. 418-93.000.

Adams, Frederick John; and Alderton, Howard Kenneth, to Cam Gears Limited. Collapsible steering columns. 3,851,542, Cl. 74-492.000.

Adams, Leonard H.: *See—*
Schneider, Kurt A.; Adams, Leonard H.; and Hilpert, Conrad R., 3,851,739.

Adler, Karl; and Ducommon, Georges, to Biviator S.A. Instrument for measuring ultia-violet light. 3,851,970, Cl. 356-51.000.

Adler, Norman; and Gamin, Leopoldo Lazaro, to New England Nuclear Corporation. Bone seeling technetium 99m stannous phosphate complex. 3,852,414, Cl. 424-1.000.

Adler, Seymour; Nuttall, Fleet E.; and Shapero, Wallace H., to Mattell, Inc. Method of making foam plastic bodies having lifelike outer skins. 3,852,389, Cl. 264-46.400.

Afful, Matthew K., to General Electric Company. Rack support assembly in a dishwasher. 3,851,943, Cl. 312-347.000.

AG fur Elektroakustik: *See—*
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AGA Aktiebolag: *See—*
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Turner, James, 3,851,811.
Werz, Siegfried; and Zanner, Johann, Jr., 3,851,952.

Aghazadeh, Shirzad, to Singer Company, The. Digital data encoding and reconstruction circuit. 3,852,811, Cl. 360-51.000.

Agness, Jay Byron; Ziegler, Duane Herbert; and Penfold, Garn Farley, to Deere & Company. Automatic height control system for a crop harvester. 3,851,451, Cl. 56-10.200.

Ahrweiler, Karl-Heinz; Appenzeller, Valentin; Quoos, Kurt; and Kusters, Edward, to Kusters, Eduard, Maschinenfabrik. Continuous press. 3,851,685, Cl. 144-281.00b.

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Aida, Yoshimoto: *See—*
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Aircraft Instruments, Inc.: *See—*
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Aktiebolaget Electrolux: *See—*
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Albany International Corp.: *See—*
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Alberto, Bocca; and Mario, Pagani. Universal charging device for the insertion of eyelets, rivets, hooks and similar by revetting machines. 3,851,743, Cl. 193-2.00c.

Alchorn, Terence R.; Gans, Werner A.; and Mellana, William D., to United States of America, Navy, mesne. Explosive energy transfer system. 3,851,587, Cl. 102-27.00r.

Alcyon Electronique et Physique S.A.: *See—*
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Holoubek, George Henry; Ales, David Edward; Harms, Harland Elmer; Erickson, Warren E.; Ditmars, Maurice A.; and Brookhart, J. Keith, 3,851,568.

Alexander, Alex E., to Kam-Act Enterprises, Inc. Force multiplying type archery bow. 3,851,638, Cl. 124-24.00r.

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Alfa-Laval Bergedorfer Eisenwerke GmbH: *See—*
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All-Steel Inc.: *See—*
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Altenberger, Edmund C. Burglar alarm actuated by cut telephone wire. 3,852,541, Cl. 179-175.250.

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Booth, Robert Ben, 3,852,403.
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American Sterilizer Company: *See*—
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Amerock Corporation: *See*—
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Ames, Irving, to International Business Machines Corporation. Josephson tunneling circuits with superconducting contacts. 3,852,795, Cl. 357-5.000.
Amin, Ashok Babubhai, to American Cyanamid Company. Process for defluorination of phosphate rock. 3,852,493, Cl. 426-381.000.
AMP Incorporated: *See*—
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Ampex Corporation: *See*—
Johnson, Delmar R.; and Elkus, Rickard J., Jr., 3,852,814.
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Andersen, Delmar L.; Boston, Louis R.; and Seleen, William A. Culture media for starter production. 3,852,158, Cl. 195-100.000.
Anderson, Donald L.: *See*—
Vogel, Ralph A.; Anderson, Donald L.; Chattin, Robert A.; and Mosak, Joel L., 3,851,682.
Anderson, John Everett. Gate setting device. 3,851,486, Cl. 61-63.000.
Anderson, Lloyd L., to Amerock Corporation. Self-closing butt hinge. 3,851,354, Cl. 16-180.000.
Anderson, Paul L., to Sandoz-Wander, Inc. N-substituted amino-n-nitroso-aminoacetonitriles for treating hypertension. 3,852,448, Cl. 424-250.000.
Anderson, Ralph F. Method and apparatus for dispensing semi-fluid material. 3,851,795, Cl. 222-1.000.
Anderson, Ray C. Automatic sound film projector-player. 3,851,957, Cl. 352-123.000.
Anderson, Richard M.: *See*—
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Ando, Shigeru; and Miyazawa, Takayuki, to Mitsubishi Denki Kabushiki Kaisha. Stereoscopic television system. 3,852,524, Cl. 178-6.500.
Andres, William A.; Quanrud, Larry D.; Koppa, Charles J.; Becker, Larry F.; Christoffersen, William K.; and Keely, James L., to Washington Scientific Industries, Inc. Projection screen. 3,851,950, Cl. 350-125.000.
Andrews, Harry N.: *See*—
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Andrews, Richard A.; and Remick, Ralph B., Jr., to Trerice, H. O., Co., mesne. Dial thermometer. 3,851,529, Cl. 73-362.800.
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Angelini, Sergio, to B.E.S. Brevetti Elettrogalvanici Superfiniture S.A. Method and apparatus for carrying out continuous thick chrome plating of bar, wire and tube, both externally and internally. 3,852,170, Cl. 204-28.000.
Ankney, Margaret G.: *See*—
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Ankney, Robert W., deceased (by Ankney, Margaret G.; executrix), to Weatherchem Corporation. Container. 3,851,792, Cl. 220-253.000.
Ankudowicz, Waclaw: *See*—
Jozwicki, Ryszard; Kubica, Henryk; Ankudowicz, Waclaw; Jedryka, Tadeusz; Roszewska, Irena; Kurzyniec, Stanislaw; Swietoslawski, Roman; and Olczyk, Franciszek, 3,851,455.
Aoki, Toshio: *See*—
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Aoyama, Haruko. Sanitary toilet seat cover. 3,851,341, Cl. 4-243.000.
Appenzeller, Valentin: *See*—
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ARA Products, Inc.: *See*—
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Arai, Toshimasa, to Nagoya Institute of Technology, President of. Rolling method for manufacturing plastic gears. 3,852,400, Cl. 264-154.000.
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Argabright, Perry A.; and Presley, C. Travis, to Marathon Oil Company. Sealed porous earth formations and process for their manufacture. 3,851,479, Cl. 61-36.00r.
Argabright, Perry A.; Presley, C. Travis; and Davis, John A., to Marathon Oil Company. Treatment of porous surfaces of articles of manufacture. 3,852,100, Cl. 117-123.00c.
Arioli, Vittorio: *See*—
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Ariyan, Zaven S.; and Harrison, William A., to Uniroyal, Inc., and Uniroyal, Ltd. 4-phenyl-2-(3-pyridyl)-thiazole carboxamides. 3,852,293, Cl. 260-294.80d.
Arizona Chemical Company, mesne: *See*—
Phillips, Ronald Frank, 3,852,218.
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Flagg, Willard A., Jr., 3,852,728.
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Aronson, Theodore F. High speed sheet feeding apparatus. 3,851,871, Cl. 271-11.000.
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Artbauer, Jan, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Gas insulated high voltage cable. 3,852,511, Cl. 174-11.00r.
Artistic Woodwork Co., Ltd.: *See*—
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Arvey Corporation: *See*—
Stage, Leo J., 3,851,814.
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ASC Industries, Inc.: *See*—
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Ashley, Burnis C. Heart beat noise eliminating pillow. 3,851,347, Cl. 5-338.000.
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Asselman, George Albert Apolonia; and Castelijns, Adrianus Petrus, to U.S. Philips Corporation. Hot-gas engine and method of manufacturing same. 3,851,471, Cl. 60-517.000.
Astra Nutrition Aktiebolag: *See*—
Knutsen, Tryggve Lund; and Osterman, Sven-Olof, 3,852,260.
Atchison, George J.; and Sundquist, Donald J., to Dow Chemical Company, The. Method of radiation cross-linking olefin polymers containing acrylate cross-linking promoters. 3,852,177, Cl. 204-159.170.
Ateliers de Constructions Electriques de Charleroi (ACEC): *See*—
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Douglass, Burdette L., 3,851,855.
Augstein, Joachim; Alexander, David; and Ham, Allan Leslie, to Pfizer Inc. Heterocyclic derivatives of phenoxypropanolamines. 3,852,291, Cl. 260-256.40c.
August, John L., Jr.; and Cuscino, Richard T., to General Electric Company. Regenerator support system for marine gas turbine. 3,851,607, Cl. 114-.50r.
Augustin, Rolf M., Jr.; and Moodie, Donald E., to Polaroid Corporation. Film pack adapter. 3,852,780, Cl. 354-86.000.
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Babler, James H. 3,3-Dimethyleyclohexylidene- acetonitriles. 3,852,321, Cl. 260-464.000.
Backman, William R., Jr.; and Walsh, George M., said Walsh assor. to Raytheon Company. Sonar depth tracking system. 3,852,705, Cl. 340-3.00r.
Bacso, Imre; and Cooke, George A., to Sandoz-Wander, Inc. Preparation of mannich bases. 3,852,312, Cl. 260-397.400.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
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Baile, Clifton A.; Gallagher, Gregory; McLaughlin, Carol L.; and Webb, Robert Lee, to Smith Kline & French Laboratories. Methods and compositions for increasing feed intake of animals using tertiary alcohols. 3,852,473, Cl. 424-343.000.
Bailey, Clifford Michael; and Mous, Gerarous Adrianus, to Cincinnati Milacron Inc. Hypotenuse correction circuit. 3,852,580, Cl. 235-152.000.
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Baker, J. J., Company: *See—*
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Baker, Maurice William; Crowley, Jennifer; Watkins, Thomas Iswel; and Clark, Nigel George, to Boots Pure Drug Company Limited. Carbamoylbenzotriazole anthelmintics. 3,852,457, Cl. 424-269.000.
Baker, Merle W. Training aid-guide device for pool cue. 3,851,876, Cl. 273-24.000.
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Balke, Roy Leonard; and Cipriani, Domenico, to General Electric Company. Channel shaped laminated high temperature slot wedge for dynamoelectric machines. 3,852,137, Cl. 156-196.000.
Ball, Charles W.; and Brodsky, Alexander. Combination spade or shovel and sifter. 3,851,763, Cl. 209-419.000.
Bando, Satoshi; Hara, Kazuo; Yoshitake, Toshihiko; and Tasaka, Takeo, to Kuraray Co., Ltd. Low shrinkage unsaturated polyester resin compositions containing graft copolymers. 3,852,376, Cl. 260-862.000.
Banks, Neill K., Jr., to Bomco, Incorporated. Acoustic damping structures. 3,851,724, Cl. 181-33.00g.
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Barbeau, Raymond A.; McGinnis, Bernard W.; and Schultz, Frederick A., to International Business Machines Corporation. Stabilization of partitionable memory with flexible rotating discs. 3,852,820, Cl. 360-99.000.
Barber-Colman Company: *See—*
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Bard, C. R., Inc.: *See—*
Monestere, Martin, Jr.; and Vaillancourt, Vincent L., 3,851,647.
Barham, Harold N.; and Barham, Harold N., Jr. Method for sorption of urea by whole cereal grains. 3,852,498, Cl. 426-69.000.
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Barlow, Gordon A.; and Glass, Marvin L., to Glass, Marvin, & Associates. Animated doll. 3,851,418, Cl. 46-120.000.
Barnes, Thomas W., to Richmond Manufacturing Company, The. Horizontal earth boring machine. 3,851,716, Cl. 175-45.000.
Barney, Harold L.; and David, Edward E., Jr., to Bell Telephone Laboratories, Inc. Object location system. 3,852,706, Cl. 340-6.00r.
Barouh, Victor; Glenn, Robert; and Giaccone, Sylvester. Method for correcting mistyped business forms. 3,852,689, Cl. 117-2.0tc.
Barringer, Anthony Rene, to Barringer Research Limited. Geophysical prospecting method and apparatus utilizing correlation of received waveforms with stored reference waveforms. 3,852,659, Cl. 324-6.000.
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Barry, Vincent T.; and Privon, George T., to Carrier Corporation. Control circuit. 3,852,648, Cl. 318-221.00h.
Barthalon, Maurice. Method for winding electric coils and electric coils produced thereby. 3,851,830, Cl. 242-7.030.
Barton, Lucian Anthony: *See—*
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Basadur, Marino Sidney, to Procter & Gamble Company, The. Hard surface rinse-coating composition and method. 3,852,075, Cl. 106-11.000.
BASF Aktiengesellschaft: *See—*
Merger, Franz; and Duembgen, Gerd, 3,852,335.
Bashev, Lev Alexandrovich: *See—*
Brodov, Valery Fedorovich; Osipov, Vyacheslav Stepanovich; Zhdanov, Mikhail Dmitrievich; Burov, Anatolievich; Kovalev, Fedor Lukich; But, Anatoly Illarionovich; Ivanov, Vadim Georgievich; Belyaev, Nikolai Nikolaevich; and Bashev, Lev Alexandrovich, 3,852,01.
Bastiaans, Cedric R., to Westinghouse Electric Corporation. High speed cartridge. 3,851,840, Cl. 242-198.000.
Bastiaans, Cedric R., to Westinghouse Electric Corporation. High speed tape cassette. 3,851,841, Cl. 242-199.000.
Bastiaans, Cedric R. High speed tape cassette. 3,851,842, Cl. 242-199.000.
Batchelor, David H., Jr., to Monsanto Company. Stabilization of polyester fibers with carbodiimide. 3,852,101, Cl. 117-138.80f.
Bath Institute of Medical Engineering, The: *See—*
Horstmann, Bevan Graham; and Vincent Frederick Reginald, 3,851,917.
Battelle Memorial Institute: *See—*
Wheeler, Kenneth R.; Sump, Kenneth R.; and Karagianes, Manuel T., 3,852,045.
Baude, Lucien Louis, to Etablissements Joints. Expansible element for an assembling device and devices including said element. 3,851,559, Cl. 85-64.000.
Baum, Arthur A.; and Rothman, Leonard A., to Du Pont de Nemours, E. I., and Company. Process for color stable alkyl and alkenyl acid phosphate compositions. 3,852,288, Cl. 260-247.70d.
Baum, Hans; Reinicke, Ralf; and John Dieter, to Saint-Gobain Industries. Manufacture of electrically heated windows. 3,851,581, Cl. 101-129.000.
Baum, Hans; Reinicke, Ralf; and John, Dieter, to Saint-Gobain Industries. Electrically heated windows. 3,852,564, Cl. 219-522.000.
Bauman, Joel: *See—*
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Draber, Wilfried; Regel, Erik; Buchel, Karl Heinz; Eue, Ludwig; and Schmidt, Robert R., 3,852,056.
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BBC Brown Boveri & Company Limited: *See—*
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Beal, Philip E., III; Fonken, Gunther S.; and Pike, John E., to Upjohn Company, The. Prostaglandin F_2 analogs. 3,852,316, Cl. 260-413.000.

Beali, Nelson J., to General Mills, Inc. Package for uniformly shaped chip type snack food products. 3,852,485, Cl. 426-106.000.

Bean, Charles P., to General Electric Company. Method for forming selectively perforate bodies. 3,852,134, Cl. 156-8.000.

Bean, Lloyd F.: *See—*
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Bearden, John E., to Environmental Technology Corporation. Liquid treatment apparatus. 3,852,384, Cl. 261-77.000.

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Bebick, Paul J.: *See—*
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Bechtold, Max Fredrick; and Tullock, Charles William, to Du Pont de Nemours, E. I., and Company. Composition of isomeric trichlorodifluorobenzenes. 3,852,366, Cl. 260-650.00f.

Becker, Kunibert: *See—*
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Beckman Instruments, Inc.: *See—*
Kampf, Richard S., 3,852,769.

Beddoe, Justin M. Portable combination cooking apparatus and method. 3,851,639, Cl. 126-25.00r.

Behr, Raymond D., to Dow Chemical Company, The. Manufacture of film having formed fastener means therein. 3,852,386, Cl. 264-40.000.

Belitskaya, Marina Sergeevna; and Volkov, Lev Nikolaevich. Monostable multivibrator controlled by a train of signals of a different polarity. 3,852,622, Cl. 307-273.000.

Bell Telephone Laboratories, Inc.: *See—*
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Bell Telephone Laboratories, Incorporated: *See—*
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Lee, Tien Pei; and Li, Tingye, 3,852,591.
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Bellmann, Gunter Gert; Groult, Alain Maurice; and Arendt, John Harry, to Etat Francais, represente par le Ministre d'Etat Charge de la Defense Nationale-Delegation Ministerielle pour l'Armement-Direction des Recherches et Moyens d'Essais. Adamantane base plybenzoxazole. 3,852,239, Cl. 260-46.50r.

Beloit Corporation: *See—*
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Belokoskov, Valentin Ivanovich: *See—*
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Kolesikova, Nina Ivnovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,852,431.

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Benasutti, Louis Dean; and Reid, Robert C., to General Motors Corporation. Cabinet sliding panel and tracking arrangement. 3,851,939, Cl. 312-138.00r.

Bendix Corporation, The: *See—*
Carp, Ralph W.; Weissler, Harold E., II; and Krawczak, Gale F., 3,852,616.
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Benoit, Roland A.; and Guillot, Edmond P., to Interroyal Corporation. Safety side mechanism. 3,851,345, Cl. 5-331.000.

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Bentley, Floyd Edward, to Jefferson Chemical Company, Inc. Liquid olefin sulfonate detergent. 3,852,221, Cl. 252-548.000.

Bentley, Stanley L., to Ransburg Corporation. Electrostatic coating apparatus. 3,851,618, Cl. 118-7.000.

Bentz, Francis: *See—*
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Bentz, Francis; Brokmeier, Dieter; Reinehr, Ulrich; and Nischk, Gunther, to Bayer Aktiengesellschaft. Shaped structures of acrylonitrile polymers containing antistatic additives. 3,852,255, Cl. 260-88.70r.

Berg, Harry, to H. B. Contracting Ltd. Shoring jacking. 3,851,856, Cl. 254-93.00r.

Berg, Otto: *See—*
Aarflot, Aksel Ola; Rudi, Fred; Sorensen, Gunnar Birger; Alvsaker, Bjarne; and Berg, Otto, 3,852,122.

Bergstrom, Peter Christoph; Birgersson, Dick Carl Birger; and Birgersson, Gustav Harald. Tool assembly, particularly for lathe chip separating tools. 3,851,551, Cl. 82-37.000.

Bergstrom Sune; and Sjovall, Jan. PGF tetraols and alkanoyl esters. 3,852,337, Cl. 260-488.00r.

Bernstein, Seymour: *See—*
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Berryman, William O., to Baker Oil Tools, Inc. Substantially contant time delay fishing jar. 3,851,717, Cl. 175-297.000.

Bertolino, August U.; Penkova, Joseph A.; and Carrell, William G., to Westinghouse Electric Corporation. Non-restricting conductor filterin; system for a high-voltage circuit-breaker. 3,852,550, Cl. 200-148.00b.

Bertsch, Dieter: *See—*
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Beulker, Franz; Becker, Kunibert; Rosenberg, Harry; Wieblitz, Hans-Dieter; and Kuti, Joseph, to Gewerkschaft Eisenhutte Westfalia. Mine roof support assemblies. 3,851,480, Cl. 61-45.00d.

Beyer, Jeno; and Govaert, Leonardus Eduard, to U.S. Philips Corporation. Method of and device for the manufacturing of electrical conductors. 3,851,454, Cl. 57-34.0cp.

Beyleveld, Wilhelmus M.; Oxenrider, Bryce C.; and Woolf, Cyril, to Allied Chemical Corporation. Novel fluorocarbon acids. 3,852,313, Cl. 260-404.500.

Bibbens, William H. Sealing assembly. 3,851,999, Cl. 418-142.000.

Bickel, Hans: *See—*
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Bierling, Robert: *See—*
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Biethan, Uwe; Dorffel, Jorg; Hornung, Karl-Heinz; and Riemhofer, Franz, to Chemische Werke Huls, A.G. Coating compositions. 3,852,375, Cl. 260-850.000.

Bifora-Uhren J. Bidlingmaier GmbH: *See—*
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Bischoff, Joachim: *See—*
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Bishov, Solomon J.; and Henick, Albert S., to United States of America, Army. Method of stabilizing foods with an antioxidant. 3,852,502, Cl. 426-328.000.

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Bittel, Patricia A., to Weatherchem Corporation. Force fit plastic closure. 3,851,812, Cl. 229-5.500.

Biviator S.A.: *See—*
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Bjork, Lars; Erikson, Uno Eugen; Granath, Kirsti Annikki; Ingelman, Gustav-Adolf; and Lindberg, Bernt Jabes, to Pharmacia Aktienbolag. Novel iodine containing polymers useful as X-ray contrast agents. 3,852,341, Cl. 260-519.000.

Blakemore, Thomas Raymond, to Marconi Company Limited, The. Position locating arrangements. 3,852,753, Cl. 343-113.00r.

Blanchard, Roger H.; and Clark, Charles R., to Parker-Hannifin Corporation. Aerial refueling nozzle. 3,851,852, Cl. 251-149.100.

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Bliss, Arthur E.; and Kenny, Philip C., to Varian Associates. Interface for computer and print out system for automatic step and line sync command to printer. 3,852,521, Cl. 178-5.000.

Blomberg, Peter Erik; and Boren, Karl Gunnar, to Aktiebolaget Electrolux. Tiltable air-cooled absorption refrigeration apparatus of the inert gas type. 3,851,497, Cl. 62-452.000.

Bloss, Karl H.; and Molketin, Harald, to PPG Industries, Inc. Method for increasing rate of coating using vaporized reactants. 3,852,098, Cl. 117-106.00r.

Bobcock & Wilcox Company, The: *See—*
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Bochman, Harry L., Jr.: *See—*
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Boggs, Jesse K., to Exxon Research and Engineering Company. Amine promoters for hydrohalogenation. 3,852,368, Cl. 260-657.000.

Bogner, Bruce Fredric, to RCA Corporation. Lens fed antenna array system. 3,852,761, Cl. 343-754.000.

Bohlmeyer, Frits Peter: *See—*
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Bohme, Reinhard D.; and Wessling, Ritchie A., to Dow Chemical Company, The. Process for disposing of halogen-containing plastics. 3,852,223, Cl. 260-2.300.

Bohnert, Thomas J.: *See—*
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Bohorquez, Jaime H.; and MacNeil, Norman H., to Hewlett-Packard Company. Thermal printing head. 3,852,563, Cl. 219-216.000.

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Bole, Rex, to Wellman Bibby Company Limited, The. Shaft mountings for pulleys, sprockets, coupling flanges and other machine elements. 3,851,977, Cl. 403-16.000.

Bolliger, Hans Rudolf; and Potts, Herbert Alexander, to Ciba-Geigy AG. Stable concentrated solutions of direct dyes and process for their manufacture. 3,852,029, Cl. 8-41.00r.

Bolz, Ludwig: *See—*
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Bomar Manufacturing Company, Inc.: *See—*
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Booe, James M., to Mallory, P. R., & Co., Inc. Method of making a capacitor utilizing bonded discrete polymeric film dielectrics. 3,851,363, Cl. 29-25.420.

Booth, Robert Ben, to American Cyanamid Company. Leaching uranium ores fluidized with a polyelectrolyte. 3,852,403, Cl. 423-18.000.

Boots Pure Drug Company Limited: *See—*
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Borden, Inc.: *See—*
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Borg-Warner Corporation: *See—*
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Borne, Ronald F., to University of Mississippi, The. Antiinflammatory compositions. 3,852,467, Cl. 424-319.000.

Borne, Ronald F., to University of Mississippi, The. Antiinflammatory compositions. 3,852,469, Cl. 424-319.000.

Boros, Leslie; and Loftin, Diana, to Savage Laboratories, Inc. Method of preparation and packaging of injectable nitrofurantoin sodium. 3,852,459, Cl. 424-273.000.

Borroughs, James E.; Hoppesch, Joseph P.; and Nowak, James A., to Borg-Warner Corporation. Breath testing system. 3,852,036, Cl. 23-254.00e.

Bortnick, Newman M.; White, James W.; and Hazbun, Eddy A. Double belt plastic sheet forming and take-off method. 3,852,387, Cl. 264-40.000.

Bosch, Robert, G.m.b.H.: *See—*
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Bothner, Manfred Wolfgang, to Bunker Ramo Corporation. Apparatus for testing potentiometers. 3,852,665, Cl. 324-63.000.

Bourbeau, Frank J., to General Motors Corporation. Inverter fault protection and frequency limiting circuit. 3,852,656, Cl. 321-11.000.

Bowen, Willard L., III. Method of forming sectional crankshaft. 3,851,361, Cl. 29-6.000.

Bowers, William S., to United States of America, Agriculture. Certain ethers of open chain terpenoids as insect control agents. 3,852,472, Cl. 424-342.000.

Bowman, Dennis W.; and Horn, Robert E., to United States of America, Army. Circuit to protect RF output amplifier against mismatch damage. 3,852,669, Cl. 325-151.000.

Bowman, Richard C.; Lang, Edward J.; and Grazen, Frank S., to Hooker Chemical Corporation. Resin composition and process for bond solid particles. 3,852,232, Cl. 260-29.300.

Boyd, John; and Hennel, Allan K., to Westinghouse Electric Corporation. Support for a steam generator. 3,851,626, Cl. 122-510.000.

Boyd, Thomas J. Batten roof and sheet metal batten. 3,851,434, Cl. 52-465.000.

Boye, Erhard Rudolf: *See—*
Engstrom, Per Ingemar; and Boye, Erhard Rudolf, 3,851,416.

Boynton, Sumner, to Boston Machine Works Co. Machine for applying cement to shoe components or the like. 3,851,622, Cl. 118-228.000.

Bracke, William J. I., to Labotina, S.A. Phosphates of pyrazole polymers. 3,852,259, Cl. 260-94.100.

Bragdon, Robert W.; Thunberg, Jon C.; and Moore, William P., to Grace, W. R., & Co. Process for recovering iminodiacetic acid from sodium chloride solutions. 3,852,344, Cl. 260-534.00e.

Braginetz, Paul A. Bottle closure. 3,851,783, Cl. 215-232.000.

Braking mechanism having an anti-locking system: *See—*
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Branson Instruments, Incorporated: *See—*
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Braun, Roland J.; and Buckley, Frederick, to International Business Machines Corporation. Bistable, self-compensating transducer circuit. 3,852,658, Cl. 323-16.000.

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Brenner, Walter, to Brunswick Corporation. Nitric acid recovery system. 3,852,412, Cl. 423-390.000.

Bresler, Aaron D.; Stein, Emanuel; and Erdmann, M. Otto, to International Telephone and Telegraph Corporation. Spherical double reflector antenna. 3,852,765, Cl. 343-781.000.

Breslow, Jeffrey D.; and Kramer, Norman, to Glass, Marvin, & Associates. Electrical game apparatus using a human body as part of the circuit. 3,851,875, Cl. 273-1.00e.

Breston, Michael P., mesne: *See—*
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Brey, Wilhelm; Hostetler, William; Loeffler, Earl Ferdnand; Kolm, Hubert Ernest; and Elder, Fred Grove, to Firestone Tire & Rubber Company, The. Turret assembly. 3,852,143, Cl. 156-396.000.

Bridgeford, Douglas J., to Tee-Pak, Inc. Microporous films. 3,852,224, Cl. 260-2.50m.

Bridges, Donald W.: *See—*
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Bridges, John A., to Aladdin Industries, Incorporated. Table for use with disposable meal service elements. 3,851,599, Cl. 108-25.000.

Bridgestone Liquefied Gas Company, Ltd.: *See—*
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Takemura, Satoshi; Harakon, Katsuyuki; Maeda, Mitsuaki; Sakai, Noboru; and Hamano, Etsuko, 3,851,693.

Brinkmann, Juergen; and Trippe, Gerwin, to Varta Batterie Aktiengesellschaft. Lead storage battery cell. 3,852,111, Cl. 136-26.000.

Brisman, Sven Brynolf, to AB Nynas-Petroleum. Method of producing a unit package containing bituminous material. 3,851,438, Cl. 53-23.000.

British Aircraft Corporation Limited: *See*—
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British Iron & Steel Research Association, The: *See*—
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Brocas, Alexander N. Guarded rotary mowers. 3,851,452, Cl. 56-17.400.

Brodov, Valery Fedorovich; Osipov, Vyacheslav Stepanovich; Zhdanov, Mikhail Dmitrievich; Burov, Anatolievich; Kovalev, Fedor Lukich; But, Anatoly Illarionovich; Ivanov, Vadim Georgievich; Belyaev, Nikolai Nikolaevich; and Bashev, Lev Alexandrovich. Method f wet cleaning of material fibers from impurities and wood sweat. 3,852,031, Cl. 8-139.000.

Brodsky, Alexander: *See*—
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Bentz, Francis; Brokmeier, Dieter; Reinehr, Ulrich; and Nischk, Gunther, 3,852,255.

Brooke, Dana, to Mead Johnson & Company. Zero-order release device. 3,851,648, Cl. 128-260.000.

Brookhart, J. Keith: *See*—
Holoubek, George Henry; Ales, David Edward; Harms, Harland Elmer; Erickson, Warren E.; Ditmars, Maurice A.; and Brookhart, J. Keith, 3,851,568.

Brooks, Herbert; Gearheart, John D.; and Jones, John L., to UMF Systems Incorporated. Ultramicrofiche viewer having axially movable and rotatable drum. 3,851,960, Cl. 353-27.000.

Brooks, Ralph J., to Klein, Andrew R.; a member of the firm of Synnestvedt & Lechner. Impact bumper absorbing assembly. 3,851,911, Cl. 293-84.000.

Brooks, Robert A.; and Bebick, Paul J., to Magnetic Analysis Corporation. Pulse eddy current testing apparatus using pulses having a 50% duty cycle and precise quadrature gate. 3,852,663, Cl. 324-40.000.

Brooks, Robert E., to TRW Inc. Opitcal signal recording method. 3,852,767, Cl. 346-1.000.

Brooks, Robert E., Jr.: *See*—
Calvin, Edward A.; Wheeler, Lionel H.; Brooks, Robert E., Jr.; and Campbell, Wallace C., Jr., 3,851,519.

Brosene, William G., Jr., to Magnum Automotive Equipment, Inc. Wheel rim protector. 3,851,694, Cl. 157-1.000.

Brothers, Don R. Thixotropic coating composition. 3,852,228, Cl. 260-23.70m.

Brotzmann, Karl: *See*—
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans Georg, 3,851,866.
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans George, 3,852,062.

Brouwer, Frans, to Stewart-Warer Corporation. Coordinate contour tracer. 3,852,590, Cl. 250-202.000.

Brown, Arthur V., Jr.; and Oborsh, Edward V., to Ralston Purina Company. Preparation of high protein expanded food product. 3,852,492, Cl. 426-364.000.

Brown, Harry W., to Cutler-Hammer, Inc. Electric switch with pivoting and wiping movable contactor. 3,852,557, Cl. 200-241.000.

Brown, Henry J. Method for recycling waste plastics and products thereof. 3,852,046, Cl. 44-1.00r.

Brown, James A., to Dow Chemical Company, The. Surface conversion treated magnesium. 3,852,125, Cl. 148-6.15r.

Brown, Joseph E., to Lee, Raymond, Organization, Inc., The. Combined saw horse and tool box. 3,851,756, Cl. 206-216.000.

Brown, Omar L., to Fraze, Ermal C., mesne. Easy opening container wall. 3,851,793, Cl. 220-54.000.

Brown, Woodrow I. Portable traffic marker. 3,851,616, Cl. 116-63.00r.

Brubaker, Dale R.; and Weinstein, Daniel S. Constant speed control for an automatic welder. 3,852,561, Cl. 219-125.00r.

Bruch, Walter, to Ted-Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec. Color video signal store. 3,852,520, Cl. 358-9.000.

Bruchmann, Hans-Dieter: *See*—
Zucker, Friedrich Josef; and Bruchmann, Hans-Dieter, 3,852,191.

Bruderlein, Francois T.; and Humber, Leslie, to Ayerst, McKenna and Harris Limited. Benzocyclohepta isoquinoline derivatives as CNS depressants. 3,852,452, Cl. 424-258.000.

Bruen, Charles Patrick; Low, William Wayne; and Smalley, Edmund Walter, to Allied Chemical Corporation. Process for the production of sodium chromate from chromite ore. 3,852,059, Cl. 75-3.000.

Brunger, Ronald N., to International Harvester Company. Motor vehicle lamp unit. 3,852,585, Cl. 240-57.000.

Brunswick Corporation: *See*—
Brenner, Walter, 3,852,412.

Brzozowski, Steven J., to General Electric Company. Heat-pipe cooled power semiconductor device assembly having integral semiconductor device evaporating surface unit. 3,852,805, Cl. 357-82.000.

Buchel, Karl Heinz: *See*—
Draber, Wilfried; Regel, Erik; Buchel, Karl Heinz; Eue, Ludwig; and Schmidt, Robert R., 3,852,056.

Buchholt, Hans Christian: *See*—
Senning, Alexander; Buchholt, Hans Christian; Bierling, Robert; Steinhoff, Dieter; and Trossmann, Gerhard, 3,852,447.

Buck, Eleanor S. Method and means for centrifuging chilled blood samples. 3,851,817, Cl. 233-11.000.

Buckley, Frederick: *See*—
Braun, Roland J.; and Buckley, Frederick, 3,852,658.

Budrose, Charles R. Combination card and tape recorder. 3,852,817, Cl. 360-88.000.

Buehler, Martin George: *See*—
Gosney, William Milton; and Buehler, Martin George, 3,852,119.

Bunker Ramo Corporation: *See*—
Bothner, Manfred Wolfgang, 3,852,665.
Minitz, Lee, 3,852,701.

Bunyard, Alan Donald, to Norbro Pneumatics Limited. Valve. 3,851,658, Cl. 137-102.000.

Burdeska, Kurt: *See*—
Zographos, Georgeos; Pugin, Andre; and Burdeska, Kurt, 3,852,064.

Burge, Roger M.; Groesbeck, Charles W.; and Dowd, Diane D., to General Foods Corporation. Dispersible improved whey protein composition and method. 3,852,506, Cl. 426-453.000.

Burlage, Donald W.: *See*—
Fletcher, Robert H., Jr.; and Burlage, Donald W., 3,852,742.

Burns, Cecil M.: *See*—
Leonard, William A.; Kunak, Anthony F.; Burns, Cecil M.; and Parsons, Warren N., 3,852,090.

Burov, Anatolievich: *See*—
Brodov, Valery Fedorovich; Osipov, Vyacheslav Stepanovich; Zhdanov, Mikhail Dmitrievich; Burov, Anatolievich; Kovalev, Fedor Lukich; But, Anatoly Illarionovich; Ivanov, Vadim Georgievich; Belyaev, Nikolai Nikolaevich; and Bashev, Lev Alexandrovich, 3,852,01.

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Burroughs Wellcome Co.: *See*—
Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., 3,852,276.
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Buss, Waldeen C.; and Kluksdahl, Harris E., to Chevron Research Company. Reforming with platinum on alumina derived from a byproduct of a ziegler process. 3,852,190, Cl. 208-138.000.

But, Anatoly Illarionovich: *See*—
Brodov, Valery Fedorovich; Osipov, Vyacheslav Stepanovich; Zhdanov, Mikhail Dmitrievich; Burov, Anatolievich; Kovalev, Fedor Lukich; But, Anatoly Illarionovich; Ivanov, Vadim Georgievich; Belyaev, Nikolai Nikolaevich; and Bashev, Lev Alexandrovich, 3,852,01.

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Cabot, John M., to Central Soya Company, Inc. Method of producing vegetable protein seafood substitutes. 3,852,484, Cl. 426-104.000.

Cade, Phillip J., to Electronics Corporation of America. Flame failure controls. 3,852,729, Cl. 340-228.200.

Calspan Corporation: *See*—
Rosenthal, Paul, 3,852,176.

Calvin, Edward A.; Wheeler, Lionel H.; Brooks, Robert E., Jr.; and Campbell, Wallace C., Jr., to CRC-Crose International, Inc. Internal pipe supporting mandrel. 3,851,519, Cl. 72-466.000.

Cam Gears Limited: *See*—
Adams, Frederick John; and Alderton, Howard Kenneth, 3,851,542.

Camboulives, Andre Alphonse Mederic Leon; Le Maout, Theophile Francois; Marchi, Marc Roger; and Vandenbroucke, Roger Alfred Jules, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Sealing devices. 3,851,900, Cl. 285-231.000.

Cambridge Research and Development Group: *See*—
Swain, Stephen C., 3,851,800.

Cameron, Frank L., to Westinghouse Electric Corporation. Dropout electrical fuse. 3,852,696, Cl. 337-240.000.

Camm, John James, to Girling Limited. Servo-boosters for vehicle brake systems. 3,851,565, Cl. 91-369.00b.

Cammarata, Peter S., to Searle, G. D., & Co. Labelled sulfated amylopectins and method of determining abnormal gastrointestinal mucosa. 3,852,413, Cl. 424-1.000.

Camp, Robert D.: *See*—
Fields, Jack W.; and Camp, Robert D., 3,851,807.

Campbell, Wallace C., Jr.: *See*—
Calvin, Edward A.; Wheeler, Lionel H.; Brooks, Robert E., Jr.; and Campbell, Wallace C., Jr., 3,851,519.

Cannon, Glyn E.; Kruger, James R.; Short, Theodore A.; and Jobe, Benjamin L., to Seascope Services, Inc. Apparatus and method for offshore operations. 3,851,492, Cl. 61-69.00r.

Canon Inc.: *See*—
Nagashima, Shinichiro; and Tsuchiya, Kaichi, 3,852,208.

Canon Kabushiki Kaisha: *See*—
Iura, Yukio, 3,852,778.
Komine, Yoshio, 3,851,956.
Taguchi, Tatsuya; Lura, Yukio; and Takishima, Yoshiyuki, 3,852,774.
Yamamichi, Masayoshi; and Aizawa, Hiroshi, 3,852,779.

Caprio, Gerald L.; and Parker, Norman W., to Motorola, Inc. Automatic hue control circuit. 3,852,807, Cl. 358-28.000.

Carborundum Company, The: *See—*
Murata, Yorihiro; and McMurtry, Carl H., 3,852,086.

Carbrey, Robert Lawrence, to Bell Telephone Laboratories, Incorporated. Signal shaping circuit. 3,852,619, Cl. 307-268.000.

Cardoza, Joe, to Cardoza, John R. Baler wire tension control assembly. 3,851,575, Cl. 100-4.000.

Cardoza, John R.: *See—*
Cardoza, Joe, 3,851,575.

Carignani, Milvio; Conti, Michele; Dufour-Berte, Casimiro; Rossi, Geremia; Pasero, Edoardo; and Zmolnig, Hermann, to Italsider S.p.A. Method and device for transforming slurries coming from wet purification plants for fumes from blast furnaces and basic oxgen furnaces into a controlled size granular solid material. 3,851,827, Cl. 241-65.000.

Carini, George F.: *See—*
Davies, Ben; Carini, George F.; and Weaver, Ernest P., 3,852,080.

Carlson, Donald C.: *See—*
Sommer, Gordon M.; Williams, Alfred C.; and Carlson, Donald C., 3,851,742.

Carlson, Paul A., to Wagner Electric Corporation. Dual-mode security circuit for automotive vehicles and the like. 3,852,614, Cl. 307-10.0at.

Carlson, Roy C.; King, Loyd L.; and Sofer, George A., to Jersey Nuclear Company, mesne. Nuclear reactor spacer device. 3,852,154, Cl. 176-78.000.

Carlsson, Hilding Ake Gerry, to Monark-Crescent AB. Ignition device for vaporizing burners. 3,852,024, Cl. 431-208.000.

Carmichael, John M.; West, Donald L.; and Williams, Robert A., to International Business Machines Corporation. Charge detection for ink jet printers. 3,852,768, Cl. 346-75.000.

Carney, William V.; and Deluca, Paul V., to Porta Systems Corporation, mesne. Modular jack strip assembly. 3,852,703, Cl. 339-198.00h.

Carp, Ralph W.; Weissler, Harold E., II; and Krawczak, Gale F., to Bendix Corporation, The. Frequency selection by period timing. 3,852,616, Cl. 307-233.000.

Carr, Albert A., to Richardson-Merrell Inc. 4-[4-(α-Hydroxybenzyl) piperidino]-4'-fluorobutyrophenone derivatives as tranquilizers. 3,852,455, Cl. 424-267.000.

Carrell, William G.: *See—*
Bertolino, August U.; Penkova, Joseph A.; and Carrell, William G., 3,852,550.

Carrier Corporation: *See—*
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Carson, John C., to Eocom Corporation. Adaptive imaging system. 3,852,714, Cl. 340-146.30f.

Carter-Wallace Inc.: *See—*
McLaughlin, James H., 3,852,417.

Cary, Donald S.; and Hutchinson, Charles H.; deceased (by Hutchinson, Carol W.; administratrix), said Cary assor. to Xerox Corporation. Moving belt scanning printing. 3,852,775, Cl. 354-14.000.

Casale, Renato, to Ital Elettionica S.p.A. Scanning device for scintigraphy according to three orthogonal planes. 3,852,601, Cl. 252-366.000.

Case, Charles B.; Hebert, David M.; Olson, Maylin J.; and Schubert, John C., to Standard Oil Company. Container fastening means. 3,851,789, Cl. 220-307.000.

Casewsky, Bohuslav: *See—*
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Cassidy, Patrick J.: *See—*
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Castelijns, Adrianus Petrus: *See—*
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Caterpillar Tractor Company: *See—*
Comer, Glen S., Jr.; Cryder, John R.; and Waggoner, John B., 3,851,721.
Getz, Marvin G.; Whitehurst, Gerald E.; and Walden, Gerald M., 3,851,727.
Jorgensen, Stanley A., 3,851,731.
Lukavich, Paul James, 3,851,413.
Purcell, Robert J., 3,851,712.
Stepe, Visvaldis A., 3,851,711.

Caule, Elmer J., to Olin Corporation. Method of producing tarnish resistant copper and copper alloys and products thereof. 3,852,130, Cl. 156-3.000.

Cechach, Frydlant V.: *See—*
Lojek, Rudolf; Ryska, Josef; and Cechach, Frydlant V., 3,851,408.

Celanese Corporation: *See—*
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Roberts, John D.; Ellenberg, John D.; and Keith, Charles H., 3,852,009.

Central Glass Co., Ltd.: *See—*
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Central Soya Company, Inc.: *See—*
Cabot, John M., 3,852,484.

Cesar, Jean, to Compagnie Generale de Radiologie. Radiodiagnostic apparatus including a pivotable X-ray table. 3,852,611, Cl. 250-445.000.

Ceskoslovenska Akademie Ved: *See—*
Vit, Jaroslav; Casewsky, Bohuslav; Mamula, Milan; and Marchacek, Jiri, 3,852,262.

Chacon, Manuel Frank, to Johnson Service Company. Multiple voltage monitoring apparatus. 3,852,727, Cl. 340-213.00r.

Chambers, Charles W., Jr., to Lorain Products Corporation. Test-through voltage booster circuit for telephone systems. 3,852,536, Cl. 179-16.00f.

Chamness, Leland D.: *See—*
Correll, Quentin E.; Swain, Allan L.; Oudijk, Tommy A.; Chamness, Leland D.; and Rudin, Melvin, 3,851,580.

Champion Spark Plug Company: *See—*
Green, Sam J., 3,851,637.

Charter, Wayne M., to Quaker Oats Company, The. Apparatus for making a marbled meat pet food. 3,851,570, Cl. 99-450.200.

Chattin, Robert A.: *See—*
Vogel, Ralph A.; Anderson, Donald L.; Chattin, Robert A.; and Mosak, Joel L., 3,851,682.

Cheetham, John Norman, to Yarsley Research Laboratories Limited. Cleaning mowing webs by passage between opposed flexible polyurethane foam wipers. 3,852,109, Cl. 134-9.000.

Chekotilo, Leonty Vasilievich: *See—*
Paton, Boris Evgenievich; Theodorvar, Boris Izhailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Makhailovich; Artamonov, Viktor Leonidovich; Bodarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich, 3,852,510.

Chem-E-Watt Corporation,mesne: *See—*
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Chemische Werke Huls Aktiengesellschaft: *See—*
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Chen, Karl K.; and Patel, Hiralal V., to Weatherhead Company, The. Swing-open crimper. 3,851,514, Cl. 72-402.000.

Chen, Nai Y.; and Garwood, William E., to Mobil Oil Corporation. Shape-selective conversion in the liquid phase. 3,852,189, Cl. 208-120.000.

Chenault, Roger; and Prigent, Raymond, to Commissariat a l'Energie Atomique. Reader for radiothermoluminescent dosimeter. 3,852,589, Cl. 250-337.000.

Cheris, Maynard H.: *See—*
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Chesapeake Instrument Corporation: *See—*
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Chesebrough-Pond's Inc.: *See—*
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Cheskis, Harvey P.: *See—*
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Hawkes, George R.; Hodgson, Clive; Reed, Marion G.; and Toland, William G., 3,852,055.
Kemp, Jacob D., 3,852,371.
Kohn, Gustave K., 3,852,490.
Stangeland, Bruce E.; and Egan, Clark J., 3,852,207.

Chia, Yuan-Tsan; and Seidel, William C., to Du Pont de Nemours, E. I., and Company. Catalytic isomerization of 2-methyl-3-butenenitrile to a linear pentenenitrile. 3,852,328, Cl. 260-465.900.

Chicago Dyanmic Industries, Inc.: *See—*
Heide, Stanford M., 3,852,554.

Chilevich, Eduard Mikhailovich: *See—*
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Chow, Sidney Hsin Huai; and Verbsky, James Daniel. Purification of 1,4-butanediol by vacuum distillation with side stream recovery. 3,852,164, Cl. 203-91.000.

Christensen, Burton G.: *See—*
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Christgau, Hermann: *See—*
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Christman, Robert D.; McKinney, Joel D.; Readal, Thomas C.; and Yanik, Stephen J., to Gulf Research & Development Company. Hydrodesulfurization and FCC of blended stream containing coker gas oil. 3,852,185, Cl. 208-89.000.

Christman, Robert D.; McKinney, Joel D.; and Readal, Thomas C., to Gulf Research & Development Company. Combination hydrodesulfurization and FCC process. 3,852,186, Cl. 208-89.000.

Christman, Robert D.; McKinney, Joel D.; Readal, Thomas C.; and Yanik, Stephen J., to Gulf Research & Development Company. Hydrodesulfurization process for producing fuel oil and FCC feed. 3,852,187, Cl. 208-89.000.

Christoffersen, William K.: *See—*
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Ciba Geigy Corporation: *See—*

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Ciba Limited: *See—*
Martin, Henry; and Drabek, Jozef, 3,852,438.
Ciba-Geigy AG: *See—*
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Hennart, Claude; and Dulat, Marcel Louis, 3,852,439.
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Cincinnati Milacron Inc.: *See—*
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Circle Miling, Inc.: *See—*
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Cirkler, Werner; Schauer, Alois; and Kausche, Helmold, to Siemens Aktiengesellschaft. Continuous cathode sputtering system. 3,852,181, Cl. 204-298.000.
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Clark, Charles R.: *See—*
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Clarke, Joseph Brian, to Coleco Industries, Inc. Board-type game with removable play selector member. 3,851,878, Cl. 273-94.00r.
Clarke-Gravely Corporation: *See—*
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Clasen, Claus J. Werner, to Standard Car Truck Company. Dampened railway truck bolster wear plate. 3,851,595, Cl. 105-197.0db.
Clawson, Robert G.; and Willis, Wilburn C., to Aluminum Company of America. Container closure with vent opening means. 3,851,782, Cl. 215-56.000.
Clay, Howard W.; and Schmitt, Donald E., to Reed Industries, Inc. Meter box with vault latch. 3,851,942, Cl. 312-333.000.
Cleaveland, Charles M., to Westinghouse Electric Corporation. Puffer-type compressed-gas circuit-interrupter. 3,852,551, Cl. 200-148.00a.
Clement, Jack M., to Gould Inc. Electric resistance heating element. 3,852,568, Cl. 219-375.000.
Coal Industry (Patents) Limited: *See—*
Powell, John Lawrence; Winter, Peter John; and Pritchard, Ernest, 3,852,428.
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Cofield, Eugene P., Jr.; and Rowe, Richard G., to Scripto, Inc. Fingerprint apparatus. 3,851,619, Cl. 118-31.500.
Coker, Charles Walter, Jr., to International Business Machines Corporation. Return to zero detection circuit for variable data rate scanning. 3,852,809, Cl. 360-40.000.
Coleco Industries, Inc.: *See—*
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Colgate-Palmolive Company: *See—*
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Plumat, Emile; Van Laethem, Robert; Colignon, Pierre; Wasterlain, Michel; and Votquenne, Pierre, 3,852,136.
Collier, John Covell, to AMP Incorporated. Electrical connector for flexible flat cable. 3,851,945, Cl. 339-97.00c.
Collins, David A.; and Wieder, Harry H. Raster pattern magnetoresistors. 3,852,103, Cl. 117-212.000.
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Colucci, Ivo, to Alfa Romeo S.p.A. Windshield and/or rear window positioning member and attendant peripheral glass rim in motor car bodies. 3,851,433, Cl. 52-401.000.
Columbia Ribbon & Carbon Manufacturing Co., Inc.: *See—*
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Comalco (J. & S.) Pty. Limited: *See—*
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Garner, Kenneth Bishop; and Roberson, Lewis Shepherd, 3,851,516.
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Comer, Glen S., Jr.; Cryder, John R.; and Waggoner, John B., to Caterpillar Tractor Company. Supplemental fluid supply. 3,851,721, Cl. 180-79.20r.
Commercial Solvents Corporation: *See—*
Urry, Wilbert Herbert; and Mullenbach, Guy Towns, 3,852,307.
Commins, James A. Emission monitoring system. 3,852,730, Cl. 340-237.00r.
Commissariat a l'Energie Atomique: *See—*
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Communications Satellite Corporation: *See—*
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Connel, Allan A. Inhalation anesthesia device. 3,851,645, Cl. 128-188.000.
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Container Corporation of America: *See—*
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Continental Oil Company: *See—*
Maxson, Orwin G.; and Achenbach, Gary D., 3,851,704.
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Control Data Canada, Ltd.: *See—*
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Hopkins, Alton W., 3,851,502.
Converse, Vernon G., III; and Lizzio, Angelo A., to Scans Associates, Inc. Apparatus for testing carburetors. 3,851,523, Cl. 73-118.000.
Cook, Edward H., Jr.; Emery, Alvin T.; and Schoepfle, Blaine O., to Hooker Chemical Corporation. Patching damaged cation-active permselective diaphragms. 3,852,135, Cl. 156-94.000.
Cook, Kenneth J.; and Korwitz, Norman H., to Beaumont, William, Hospital. Bed egress alarm circuit. 3,852,736, Cl. 340-279.000.
Cook, Ronald Joseph, to Matburn (Holdings) Limited. Surgical operation table. 3,851,870, Cl. 269-322.000.
Cooke, George A.: *See—*
Bacso, Imre; and Cooke, George A., 3,852,312.
Cooney, William J., to GAF Corporation. Chelating compositions and detergent compositions pertaining to same. 3,852,213, Cl. 252-181.000.
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Walmet, Gunnar E.; Corman, James C.; and McLaughlin, Michael H., 3,852,803.
Corman, James C.; McLaughlin, Michael H.; and Walmet, Gunnar E., to General Electric Company. Double-sided heat-pipe cooled power semiconductor device assembly. 3,852,804, Cl. 357-82.000.
Corman, James C.; McLaughlin, Michael H.; and Walmet, Gunnar E., to General Electric Company. Nonwicked heat-pipe cooled power semiconductor device assembly having enhanced evaporated surface heat pipes. 3,852,806, Cl. 357-82.000.
Corning Glass Works: *See—*
Davis, Robert F., 3,852,079.
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Weetall, Howard H.; and Yaverbaum, Sidney, 3,852,496.
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Correll, Quentin E.; Swain, Allan L.; Oudijk, Tommy A.; Chamness, Leland D.; and Rudin, Melvin, to Day, Albert J. Credit card voucher imprinter. 3,851,580, Cl. 101-45.000.

Corsi, Piero; and Massa, Turco, to Siam 1922 Societa' Italiana Arredamenti Metallici S.p.A. Assembly for forming metal furniture structures from interengaging element. 3,851,981, Cl. 403-237.000.

Corson, Floyd L., to CPC International Inc. Apparatus for the reactivation of powdered carbon. 3,852,038, Cl. 23-259.900.

Cosco, Inc.: *See—*
Lay, Ralph B., 3,851,918.

Cosden Oil and Chemical Company: *See—*
Souillard, Georges Jules Pierre; and Van Quaethoven, Frederic Francois Paul, 3,852,204.

Coughlin, Donald W. Testable plug shut-off and double check valve. 3,851,665, Cl. 137-614.170.

Coulter Electronics Inc., mesne: *See—*
Smith, Lester C.; Ziffer, Garret F.; and Nelson, John Russell, 3,851,972.

Court, Patrick R. J., to Optical Systems Corporation. Video and audio encoding/decoding system employing suppressed carrier modulation. 3,852,519, Cl. 178-5.100.

Couvillon, James B., to Texas Instruments Incorporated. Differential amplitude angle guidance. 3,852,752, Cl. 343-108.00m.

Cox, Don O. Article retainer for a refrigerator. 3,851,765, Cl. 211-184.000.

Coyle, Forrest E.: *See—*
Maxwell, Richard F., Jr.; Coyle, Forrest E.; and Gillespie, George W., 3,852,546.

CPC International Inc.: *See—*
Corson, Floyd L., 3,852,038.

Crane, Jacob; Friedman, Sam; and Pryor, Michael Joseph, to Olin Corporation. Process for making a novel copper base alloy. 3,852,121, Cl. 148-2.000.

Crawford, John T., to Towmotor Corporation. Lift truck fork retaining pins. 3,851,779, Cl. 214-731.000.

Crawford, Ollie Lee. Electric lamp menans. 3,852,588, Cl. 240-108.00r.

Crawley, Carroll L.: *See—*
Schlinger, Warren G.; Kaufman, Harold C.; and Crawley, Carroll L., 3,852,047.

CRC Compagnie di Ricerca Chimica S.A.: *See—*
Kajfez, Franjo; Kovac, Tomislav; and Sunjic, Vitomir, 3,852,274.

CRC-Crose International, Inc.: *See—*
Calvin, Edward A.; Wheeler, Lionel H.; Brooks, Robert E., Jr.; and Campbell, Wallace C., Jr., 3,851,519.

Crear, Jobie: *See—*
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Cresswell, Michael C.: *See—*
Roberts, John S.; and Cresswell, Michael C., 3,852,612.

Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., to Burroughs Wellcome Co. 5-Benzyl pyrimidines intermediate therefore, and method. 3,852,276, Cl. 260-240.00r.

Crest Container Corporation: *See—*
Harrison, James M., 3,852,390.

Crippa, Jean-Pierre, to Les Produits Associes SA. Removable attachment for a hand appliance for body care including coupling retaining means. 3,851,984, Cl. 403-322.000.

Crisafulli, Angelo J. Reversible endless track for vehicles. 3,851,931, Cl. 305-54.000.

Crompton & Knowles Corporation: *See—*
Roberson, James H.; and Perry, Thomas C., Jr., 3,851,924.
Roberson, James H., 3,851,925.

Crosbie, Richard B.; and Byra, Thomas A., to Uniroyal, Inc. Footwear embodying fabricless thermoplastic counter. 3,851,411, Cl. 36-68.000.

Cross, Barrington; and Arotin, Robert Louis, to American Cyanamid Company. Esters of (alkynyloxy(and (alkenyloxy) carbanilic acids. 3,852,332, Cl. 260-471.00c.

Cross, Christopher G., to PPG Industries, Inc. Strand clamping apparatus for automatic knock off system. 3,852,141, Cl. 156-351.000.

Crouse, David J., Jr.: *See—*
Schmitt, John M.; Crouse, David J., Jr.; and Howerton, William B., 3,852,407.

Crowley, Jennifer: *See—*
Baker, Maurice William; Crowley, Jennifer; Watkins, Thomas Iswel; and Clark, Nigel George, 3,852,457.

Cryder, John R.: *See—*
Comer, Glen S., Jr.; Cryder, John R.; and Waggoner, John B., 3,851,721.

Cummins, Millard M.; Best, Robert G.; and Hankins, Thomas, to Thurman Manufacturing Company. Ultrasonic cleaning device with temperature responsive cut-off. 3,851,861, Cl. 259-72.000.

Cunningham, Hugh: *See—*
Raetzsch, Carl W., Jr.; and Cunningham, Hugh, 3,852,179.

Cunningham, Hugh M. Pig growth feed composition containing methyl xanthines and salts of methyl xanthines and method of use. 3,852,451, Cl. 424-253.000.

Cuomo, Jerome J.; and Hovel, Harold J., to International Business Machines Corporation. GaN switching and memory devices and methods therefor. 3,852,796, Cl. 357-16.000.

Cuscino, Richard T.: *See—*
August, John L., Jr.; and Cuscino, Richard T., 3,851,607.

Cutler-Hammer, Inc.: *See—*
Brown, Harry W., 3,852,557.

D'Addario, Theodore A., to Velo-Bind, Inc. Debinding tool. 3,851,391, Cl. 30-280.000.

Daicel Ltd.: *See—*
Furukawa, Shogi; Sonoyama, Yuzo; and Ohi, Akira, 3,852,393.

Daido Metal Company Limited: *See—*
Morisaki, Nobukazu, 3,852,203.

Daly, James Ernest, to Hercules Incorporated. Preparation of crystalline sulfides and selenides of cadmium zinc and mercury. 3,852,404, Cl. 423-99.000.

Damewood, Marvin L., to Savage, W. J., Co., Inc. Rotatable chuck for supporting elongate work piece. 3,851,869, Cl. 269-61.000.

D'Amico, John Joseph, to Monsanto Company. Fungicidal and bactericidal 2-(N-2-cyanoethyl-dithio carbamylmethylene)-5-hydroxy-4H-pyran-4-one and metal chelates. 3,852,444, Cl. 424-245.000.

Daneilczik, Eilen: *See—*
Feldman, Jacob R.; Hamell, Matthew; and Daneilczik, Eilen, 3,852,481.

Daniels, Leander Bruce; and Fretwell, Richard D., to MI², Inc. Strappable inactivity timer for data set. 3,852,575, Cl. 235-92.00t.

Darling, Phillip H., to Kendall Company, mesne. Closed drainage system with double lumen tube. 3,851,650, Cl. 128-350.00r.

Darrow, Kenneth A.: *See—*
Hibbs, Louis E., Jr.; Darrow, Kenneth A.; and Reed, William R., Jr., 3,852,049.

Dart Industries, Inc.: *See—*
Holoubek, George Henry; Ales, David Edward; Harms, Harland Elmer; Erickson, Warren E.; Ditmars, Maurice A.; and Brookhart, J. Keith, 3,851,568.

Daughtry, Albert E. Utility instrument. 3,851,986, Cl. 403-373.000.

David, Edward E., Jr.: *See—*
Barney, Harold L.; and David, Edward E., Jr., 3,852,706.

Davies, Ben; Carini, George F.; and Weaver, Ernest P., to Dress Industries, Inc. Method for making magnesite brick. 3,852,080, Cl. 106-58.000.

Davis, Jack E. Display case stand. 3,851,601, Cl. 108-153.000.

Davis, James L.; Lopke, Edward L.; and Pechous, Leslie Joseph, to General Motors Corporation. Gas turbine fuel control. 3,851,464, Cl. 60-39.28t.

Davis, John A.: *See—*
Argabright, Perry A.; Presley, C. Travis; and Davis, John A., 3,852,100.

Davis, Maurice E. Drawbar steering attachment for articulated tractors. 3,851,895, Cl. 280-467.000.

Davis, Murray W. Linear induction motor. 3,852,626, Cl. 310-13.000.

Davis, Murray W. Composite stator concentric linear induction motor. 3,852,627, Cl. 310-13.000.

Davis, Robert F., to Corning Glass Works. Bao-cao-al203 glass compositions. 3,852,079, Cl. 106-50.000.

Davis, Willard Parker; Golner, Jerold Julius; and Feinstein, Sumner Sheldon, to Borden, Inc. Method of removing plasticizer mist from air. 3,852,392, Cl. 264-89.000.

Davis, William R.: *See—*
Scoville, Andrew E.; and Davis, William R., 3,852,592.

Dawe, Christopher; and Middleton, John David, to Marconi Instruments Limited. Oscillation generators. 3,852,682, Cl. 331-4.000.

Day, Albert J.: *See—*
Correll, Quentin E.; Swain, Allan L.; Oudijk, Tommy A.; Chamness, Leland D.; and Rudin, Melvin, 3,851,580.

De Luca, Paul V., to Porta Systems Corporation. Line surge protection device for telephone lines. 3,852,539, Cl. 179-174.000.

De Lyria, Karl G., 50% to Dutton, Hayward H., trustee of the Hilda Trusts 1-9, inclusive, 50% to Schulein, Joseph and Schulein, Margaret A. Apparatus for interpreting numerically coded pulse grouplins in a line. 3,852,718, Cl. 340-164.00r.

de Radzitzky d'Ostrowick, Pierre M.J.G.: *See—*
Hanotier, Jacques D. V.; and de Radzitzky d'Ostrowick, Pierre M.J.G., 3,852,343.

De Rooij, Abraham H., to Stamicarbon N.V. Process for preparing and recovering lactams. 3,852,273, Cl. 260-239.30a.

De Rooij, Abraham Hermanus, to Stamicarbon N.V. Process for removing lactams. 3,852,272, Cl. 260-239.30a.

De Vault, Albert M.; and Johnson, Marvin M., to Phillips Petroleum Company. Purification of high molecular weight polymers to reduce hydrogenation conditions. 3,852,252, Cl. 260-85.100.

De Vincent, Patsy; and Hepke, John V., to General Motors Corporation. Hose assembly with prepositioned hose mounting bracket. 3,851,672, Cl. 138-106.000.

De Voe, John M., to United States Tobacco Company. Steam condenser for retort and method. 3,852,508, Cl. 426-521.000.

De Winter, Jan Gerrit, to Nicolon N.V. Container of flexible material. 3,851,688, Cl. 150-8.000.

Deane, Clifford T.: *See—*
Yago, Jeffrey R., 3,851,560.

Dearman, Timothy C. Flanged pipe aligning tool. 3,851,401, Cl. 33-371.000.

Deere & Company: *See—*
Agness, Jay Byron; Ziegler, Duane Herbert; and Penfold, Garn Farley, 3,851,451.
Knoth, Harold Monroe, 3,851,913.
Nelson, Leon Franklin, 3,851,450.

DeGroot, Willem Herman; and Hilder, Martin Hugh, to Lever Brothers Company. Process of interesterification of gylceride oils. 3,852,315, Cl. 260-410.700.

Dehler, Bernhard, to Metallwerk Max Brose & Co. Electrically operated window lifting mechanism. 3,851,533, Cl. 74-89.000.

Del Fava, Donald A., to Raychem Corporation. Conductive insert for heat recoverable electrical connector. 3,852,517, Cl. 174-84.00r.

Delalande S.A.: *See—*
Fauran, Claude P.; Turin, Michel J.; Raynaud, Guy M.; and Gouret, Claude J., 3,852,284.

Delauzun, Robert, to Societe Anonyme: Seperef-TMP Societe pour l'Equipment des Reseaux en Canalisations de Matieres Plastiques. Retractable mandrel for bulging out and forming an annular peripheral groove in plastic tubes. 3,852,016, Cl. 425-393.000.

Deluca, Paul V.: *See—*
Carney, William V.; and Deluca, Paul V., 3,852,703.

DeLuca, Paul V., to Porta Systems Corporation. Telephone relay repair kit with spaced contact boards. 3,852,645, Cl. 317-113.000.

DEMAG Aktiengesellschaft: *See—*
Reth, Erich, 3,851,510.

Demarest, Henry M., Jr., to PPG Industries, Inc. Method of producing decorated glass-ceramic surfaces. 3,852,052, Cl. 65-30.000.

Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., to Ayerst, McKenna and Harrison Limited. Pyrano- and thiopyranoindole derivatives. 3,852,285, Cl. 260-247.001.

Denkowski, Walter J.; and Zouzoulas, John, to Philadelphia Gear Corporation. Torque switch mechanism. 3,851,538, Cl. 74-425.000.

Densmore, Neal W. Self-troughed conveyor belt rebersing apparatus and method. 3,851,752, Cl. 198-192.000.

Denton, Wayne L.: *See—*
Heumann, Aubrey C., Jr.; Denton, Wayne L.; and Fitzpatrick, Jimmie D., 3,852,500.

Derror, Fred L., to Mansfield Sanitary, Inc. Apparatus for a system to extricate intricate, ceramic shaper from multiple piece molds. 3,852,017, Cl. 425-451.000.

Design Elements, Inc.: *See—*
Fretwell, Richard D.; and Azbell, James W., 3,852,531.
Mason, Edwin E., 3,852,646.

Desmond, John D.; and Hart, Joseph I., to Container Corporation of America. Folded pre-wrap carton. 3,851,815, Cl. 229-87.00r.

Dessert, Jean Marcel, to Renn-Cupit Industries Ltd. Method of constructing cable tray. 3,851,378, Cl. 29-523.000.

Deuel, James Leslie, to American Can Company. Method of making folds in coated fiber containers. 3,852,138, Cl. 156-227.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Rothbuhr, Lothar; and Fritz, Walter, 3,852,399.

Deutsche Supraton Bruchmann & Zucker KG: *See—*
Zucker, Friedrich Josef; and Bruchmann, Hans-Dieter, 3,852,191.

DeWerdt, Reinier: *See—*
Kooi, Else; DeWerdt, Reinier; and Nijdam-Paffen, Maria Magdalena Mathilda, 3,852,104.

Di Marco, Bernard; and Kralik, Andrew W., to I-T-E Imperial Corporation. Overload relay with fast acting bimetal on high current. 3,852,694, Cl. 337-62.000.

Diamond, Julius; and Santora, Norman Julian, to William H. Rorer, Inc. Phenylacetic acids. 3,852,323, Cl. 260-465.00d.

Diamond, Julius, to Rorer, William H., Inc. Ethynylbenzene compounds derivatives thereof. 3,852,364, Cl. 260-649.00r.

Dichter, Hans-Joachim. Method and apparatus for producing ampoules. 3,852,054, Cl. 65-109.000.

Dickfeldt, Siegfried, to Varta Batterie Aktiengesellschaft. Gastight alkaline battery with paste and sintered electrodes. 3,852,110, Cl. 136-6.00r.

Diebold Incorporated: *See—*
Anders, Walter G., 3,851,764.

Diehl: *See—*
Meisner, Alfred; and Spitzl, Walter, 3,851,385.

Diethelm, Beda, to AG fur Elektroakustik. In ear hearing apparatus. 3,852,540, Cl. 179-107.00e.

Dietz, Henry G. Differential pressure switch with hinged plate on diaphragm. 3,852,547, Cl. 200-834.000.

Diguet, Daniel, to U.S. Philips Corporation. Method of carrying out diffusions with two sources. 3,852,129, Cl. 148-189.000.

Dillman, Thayer L.: *See—*
Spisak, Andrew J.; and Dillman, Thayer L., 3,852,628.

Dilny, Mike M. Adjustable boom attachment. 3,851,777, Cl. 214-620.000.

Dimensional Development Corporation: *See—*
Nims, Jerry Curtis; and Wah Lo, Allen Kwok, 3,852,787.

Dinsmore, Robert L.; and Ivey, Herbert D., to Lubrication Company of America. Sulfur halogenated cutting oil and process of making. 3,852,206, Cl. 252-48.800.

Distrib-U-Mat, Inc., mesne: *See—*
Liblick, Herbert, 3,851,762.

Ditmars, Maurice A.: *See—*
Holoubek, George Henry; Ales, David Edward; Harms, Harland Elmer; Erickson, Warren E.; Ditmars, Maurice A.; and Brookhart, J. Keith, 3,851,568.

Dobson, Thomas A.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 3,852,285.

Doerhoefer, Guenther, to Ciba-Geigy Corporation. [CNS compositions and method with 4-(5,10-dihydro-4H-benzo[5,6]cyclohepta[1.2-b] thienyl-4-yl-1-piperazinyl-alkyl]-3-alkyl-2-imidazolidinones. 3,852,445, Cl. 424-250.000.

Doggett, Neil: *See—*
Leach, Roger; Doggett, Neil; and Lappage, James, 3,851,698.

Dojyo, Satoshi; and Yoshino, Tsutomu, to Toyo Kogyo Co., Ltd. Honing machine for finishing trochoidal bore or rotor housing of rotary engine. 3,851,422, Cl. 51-34.00j.

Dolch, Volker, to Scanner, Inc. Alignment correction for read scan raster fields. 3,852,573, Cl. 235-61.11e.

Dole Electro-Systems, Incorporated: *See—*
Reid, Walter L., Jr.; Peirce, C. Condit; and Pelletier, Raymond G., 3,851,367.

Dole Refrigerating Company: *See—*
Rupert, Donald N., Jr., 3,851,496.

Dolfini, Joseph E., to Squibb, E. R., & Sons, Inc. Certain 2-substituted cephalosporins. 3,852,282, Cl. 260-243.00c.

Dolfini, Joseph Edward; and Erickson, Raymond Curry, to Squibb, E. R., & Sons, Inc. Amino acid derivatives of cephalosporins. 3,852,283, Cl. 260-243.00c.

Domergue, Annick Marthe Suzanne Simone; Mingasson, Georges Raymond Henry; and Sureau, Robert Frederick Michel, to Ugine Kuhlmann. Pyrazoline optical brightening agents. 3,852,275, Cl. 260-239.900.

Donat Talbot Archambult: *See—*
Muller, Richard, 3,851,936.

Donini, Pietro, to Instituto Farmacologico Serono S.p.A. Long-active gonadotropins. 3,852,422, Cl. 424-100.000.

Donovan, William M., to Warner-Lambert Company. Shaving unit for safety razor. 3,851,392, Cl. 30-346.580.

Doolittle, Richard D.; and Dorr, John A., to Chesapeake Instrument Corporation. Multiple element phased array with shaded sub-element groups. 3,852,708, Cl. 340-7.00r.

Dorffel, Jorg: *See—*
Biethan, Uwe; Dorffel, Jorg; Hornung, Karl-Heinz; and Riemhofer, Franz, 3,852,375.

Dorr, John A.: *See—*
Doolittle, Richard D.; and Dorr, John A., 3,852,708.

Douglas, Bobby L., to Dresser Industries, Inc. Dual string automatic gas lift valve. 3,851,997, Cl. 417-112.000.

Douglass, Burdette L., to Atwood Vacuum Machine Company. Thrust ball bearing construction for trailer jack. 3,851,855, Cl. 254-86.00r.

Douglass, Miriam Lois, to Colgate-Palmolive Company. 2-Mercaptoquinoxaline-1-oxides, salts thereof and (1-oxoquinoxalinyl) disulfides for treating hair and skin. 3,852,443, Cl. 424-250.000.

Dow Chemical Company, The: *See—*
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Watson, William David; and Kobel, Erwin H., 3,852,160.
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Dow Corning Limited: *See—*
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Dowd, Diane D.: *See—*
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Dowling, Edward Camp, to AMP Incorporated. Electrical terminal having pyramid teeth thereon. 3,852,702, Cl. 339-97.00r.

Downing, Noel L., to General Motors Corporation. Compact high speed fuel pump assembly. 3,851,998, Cl. 417-199.00a.

Dr. Beck & Co. GmbH: *See—*
Schmidt, Karl; and Neubert, Gerhard, 3,852,246.

Drabek, Jozef: *See—*
Martin, Henry; and Drabek, Jozef, 3,852,438.

Draber, Wilfried; Regel, Erik; Buchel, Karl Heinz; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Heterocyclic-substituted N-imidazol plant-growth influencing agents. 3,852,056, Cl. 71-76.000.

Dregger, Ernst Ullrich: *See—*
Pause, Kurt; Dregger, Ernst Ullrich; and Otten, Gottfried, 3,851,818.

Dress Industries, Inc.: *See—*
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Dresser Industries, Inc.: *See—*
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Ellis, Gary D., 3,851,708.
Jet, Marion Barney; and Spriggs, Dennis Mitchel, 3,851,705.
Jett, Marion Barney, 3,851,707.
Wells, Paul C.; and McGlothlin, Raymond E., 3,852,202.

Drexel, Charles F., to Tylan Corporation. Fluid flowmeter. 3,851,526, Cl. 73-202.000.

Druliner, Joe D.; and King, Charles M., to Du Pont de Nemours, E. I., and Company. Selective cis/trans isomerization of 2-pentenenitrile in a solution of pentenenitrile isomers). 3,852,327, Cl. 260-465.900.

Drustar Unit Dose Systems, Inc.: *See—*
Relyea, Kenneth D.; and Santangelo, John A., 3,851,940.

Dtaid, Inc.: *See—*
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Du Pont de Nemours, E. I., and Company: *See—*
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Incremona, Joseph H.; and Strugar, Daniel, 3,852,106.
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Kring, Elbert Victor; and Wolfe, William Ray, Jr., 3,852,169.
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Tomlinson, Peter E., 3,852,329.
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Dubin, Robert R., to General Electric Company. Cell casing and hermetically sealed primary sodium-sulfur cell. 3,852,114, Cl. 136-83.00t.

Dubois, Jean-Claude: *See—*
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Leabailly, Jacques; and Dubois, Jean-Claude, 3,852,798.

Duckworth, Albert: *See—*
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Ducommon, Georges: *See—*
Adler, Karl; and Ducommon, Georges, 3,851,970.

Ducret, Lucien C. Shielded conduit cutting device. 3,851,387, Cl. 30-90.300.

Duembgen, Gerd: *See—*
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Dufendach, William R., to Vari-Tech Company. Sector scanning servomotor controlled apparatus. 3,852,651, Cl. 318-627.000.

Dufour-Berte, Casimiro: *See—*
Carignani, Milvio; Conti, Michele; Dufour-Berte, Casimiro; Rossi, Geremia; Pasero, Edoardo; and Zmolnig, Hermann, 3,851,827.

Dugan, John J.; and Higgins, James P., to Exxon Research and Engineering Company. Hydrocarbon cracking in a regenerable molten media. 3,852,188, Cl. 208-114.000.

Duhaut, Pierre; and Miquel, Jean, to Societe Francaise des Produits Pour Catalyse. Catalyst for hydrocarbon conversion. 3,852,215, Cl. 252-441.000.

Dulat, Marcel Louis: *See—*
Hennart, Claude; and Dulat, Marcel Louis, 3,852,439.

Dumas, Daniel; Hoynant, Georges; and Vallon, Jean. Sealing of metal bars in carbonized blocks. 3,851,377, Cl. 29-493.000.

Dumitru, Ion D.; Grigoras, Victor A.; Turtureanu, Mircea Ioan T.; Stancio, Doina Ecaterina G.; and Anescu, Vasile V., to Ipran-Institutul de Proiectari Pentru Industria Chimica Anorgonica si a Ingrasamintelor. Fluidized-bed apparatus. 3,851,406, Cl. 34-57.0r.

Dunbar, Joseph E.; and Bohnert, Thomas J., to Dow Chemical Company, The. 2-(Sulfur-substituted)-3-hydroxy-5,3-dimethyl-2-cyclohexen-1-ones and preparation. 3,852,359, Cl. 260-590.000.

Dunlop Limited: *See—*
French, Tom, 3,851,691.

Dunn, James L., Jr., to Dow Chemical Company, The. Spent dye liquor clean-up and vehicle recovery. 3,852,163, Cl. 203-47.000.

Dunning, Beverly W., Jr.: *See—*
Leavenworth, Howard W., Jr.; Dunning, Beverly W., Jr.; Gabler, Robert C., Jr.; and Goldsmith, Carl E., 3,852,060.

Dura Corporation: *See—*
Kalitta, Carl L., 3,851,909.

Durand, Francois. Worm reduction gearing drive. 3,851,539, Cl. 74-425.000.

Durand, Pierre, to Richier. Tower cranes. 3,851,767, Cl. 212-48.000.

Dusza, John Paul; Lindsay, Harry Lee; and Bernstein, Seymour, to American Cyanamid Company. Substituted carbazic acid. 3,852,334, Cl. 260-471.00c.

Dutilloeil, Jacques, to Ateliers de Constructions Electriques de Charleroi (ACEC). Thyristor initiating device for high voltage D.C. line. 3,852,618, Cl. 307-252.00q.

Dutton, Hayward H., trustee of the Hilda Trusts 1-9, inclusive: *See—*
De Lyria, Karl G., 3,852,718.

East Dayton Tool & Die Company, The: *See—*
Jacobs, Orville W., 3,851,366.

Easter, William M., Jr.: *See—*
Nikawitz, Edward J.; Tavares, Robert F.; and Easter, William M., Jr., 3,852,219.

Eastman Kodak Company: *See—*
Jessop, Thomas C., 3,851,662.
Lieser, Ernst; Ort, Wolfgang; Wisst, Otto; and Hopfner, Clemens, 3,852,777.
Stoneham, Jeffrey Richard, 3,852,784.
Webster, Frank G.; and McColgin, William C., 3,852,683.
White, Neil S.; Mansfield, Donald R.; and Matthews, Noel H., 3,851,834.

Eberly, Harry C.: *See—*
Shepley, John H.; Eberly, Harry C.; Luek, Otto W.; and McIlwain, Irwin D., 3,851,904.

Ecodyne Limited: *See—*
Wachsmuth, William A.; and Lindstol, Anders, 3,852,199.

Edamura, Fred Y.; and Giacobbe, Thomas J., to Dow Chemical Company, The. Substituted thio-and dithio carbamilates. 3,852,319, Cl. 260-455.00a.

Edgcombe, Christopher John, to English Electric Valve Company, Limited. Klystrons. 3,852,636, Cl. 315-5.540.

Edison, David M.: *See—*
Sackin, Milton; and Edison, David M., 3,851,733.

Edwards, Christopher S., to British Aircraft Corporation Limited. Aligning equipment in ships and other structures. 3,851,399, Cl. 33-228.000.

Edwards, Emrys Ronald, to Westland Aircraft Limited. Aperture closure devices. 3,851,845, Cl. 244-129.00d.

Edwards, Morgan Llewellyn. Method and apparatus for breaking waves. 3,851,476, Cl. 61-1.00r.

Egan, Clark J.: *See—*
Stangeland, Bruce E.; and Egan, Clark J., 3,852,207.

Egan, Cleon J., to Albany International Corp. Woven papermaking drainage fabric having four shed weave pattern and weft threads of alternating diameter. 3,851,681, Cl. 139-420.00r.

Egloff, Adolf: *See—*
Huber, Jakob; and Egloff, Adolf, 3,851,592.

Ehrlich, John J.; and Martignoni, Pasquale, to United States of America, Army. Heating means for metal vapor lasers. 3,852,685, Cl. 331-94.500.

Eichler, Dieter; and Remmele, Walter, to Bosch, Robert, G.m.b.H. Temperature supervisory system for exhaust gas reactors for internal combustion engines. 3,851,469, Cl. 60-277.000.

Eickenbusch, Hubert: *See—*
Nienhaus, Clemens; Pieper, Rudolph; and Eickenbusch, Hubert, 3,851,903.

Einramhof, Franz; van Kronenburg, Leonardus Henricus Adrianus Theresia; and Verboven, Ghislain Felix Alfons Arthur, to U.S. Philips Corporation. Method of sealing a quartz tube. 3,852,053, Cl. 65-34.000.

Eisenwerk Gesellschaft: *See—*
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans George, 3,852,062.

Elder, Fred Grove: *See—*
Brey, Wilhelm; Hostetler, William; Loeffler, Earl Ferdnand; Kolm, Hubert Ernest; and Elder, Fred Grove, 3,852,143.

Eldridge, Harry N.; and Eldridge, Robert K. Tool for destroying hypodermic syringes. 3,851,555, Cl. 83-165.000.

Eldridge, Robert K.: *See—*
Eldridge, Harry N.; and Eldridge, Robert K., 3,851,555.

Electronics Corporation of America: *See—*
Cade, Phillip J., 3,852,729.

Electronique Marcel Dassault: *See—*
Morand, Jean Francis, 3,852,747.

Elepon Kogyo Kabushiki Kaisha: *See—*
Ihara, Eiichi, 3,851,898.

Elkus, Rickard J., Jr.: *See—*
Johnson, Delmar R.; and Elkus, Rickard J., Jr., 3,852,814.

Ellenberg, John D.: *See—*
Roberts, John D.; Ellenberg, John D.; and Keith, Charles H., 3,852,009.

Eller, Warren C.; and Valenta, Frank J., to United States of America, Navy. Temperature compensated pyrotechnic delays. 3,851,586, Cl. 102-27.000.

Ellis, Gary D., to Dresser Industries, Inc. Well packer and retriever. 3,851,706, Cl. 166-178.000.

Ellis, Gary D., to Dresser Industries, Inc. Well packer and retriever. 3,851,708, Cl. 166-237.000.

Ellzey, Lucian L., Jr. Method of tensioning bolts. 3,851,386, Cl. 29-407.000.

Elms, Robert T.: *See—*
Engel, Joseph C.; Elms, Robert T.; and Misencik, John J., 3,852,642.

Emelyanenko, July Georgievich: *See—*
Paton, Boris Evgenievich; Thedorvar, Boris Izhailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Makhailovich; Artamonov, Viktor Leonidovich; Bodarenko, Oleg Petrovich, Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich, 3,852,510.

Emery, Alvin T.: *See—*
Cook, Edward H., Jr.; Emery, Alvin T.; and Schoepfle, Blaine O., 3,852,135.

Empey, Richard A.: *See—*
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Enders, Edgar: *See—*
Wollweber, Hartmund; Enders, Edgar; and Stendel, Wilhelm, 3,852,304.

Endo, Tomio: *See—*
Mihara, Shigetoshi; Inaba, Yanosuke; Tachibana, Koichi; Endo, Tomio; and Yasui, Eiichiro, 3,852,504.

Energiagazdalkodasi Intezet: *See—*
Heller, Laszlo; Forgo, Laszlo; Bodas, Janos; Alekszejev, I. A.; and Agejev, G. Sz., 3,851,702.

Engebretsen, Einar O., to Hobart Manufacturing Company, The. Compactor with yieldable receptacle. 3,851,578, Cl. 100-229.00a.

Engel, Joseph C.; Elms, Robert T.; and Misencik, John J., to Westinghouse Electric Corporation. Sensing amplifier and trip circuit particularly for ground fault circuit interrupter. 3,852,642, Cl. 317-18.00d.

Engelhard, Philippe; and Weisang, Joseph Edouard, to Compagnie Francaise de Raffinage. Method of regulating the halogen content of hydrocarbon conversion catalysts. 3,852,217, Cl. 252-442.000.

English Electric Valve Company, Limited: *See—*

Edgcombe, Christopher John, 3,852,636.
English, Richard B.; and Benson, Rudolph T., Jr., to Armstrong Cork Company. Slitting machine. 3,851,552, Cl. 83-9.000.
English, William A.: *See*—
McCleerey, Earl W.; and English, William A., 3,852,558.
Engstrom, Per Ingemar; and Boye, Erhard Rudolf, to Gunnebo Bruks Aktiebolag. Device for cartridge chamber in cartridge tool. 3,851,416, Cl. 42-1.00r.
Environmental Technology Corporation: *See*—
Bearden, John E., 3,852,384.
Eocom Corporation: *See*—
Carson, John C., 3,852,714.
Erdmann, Hans; Miller, Franz-Friedrich; and Zissel, Alfred, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Tanning agents. 3,852,374, Cl. 260-839.000.
Erdmann, M. Otto: *See*—
Bresler, Aaron D.; Stein, Emanuel; and Erdmann, M. Otto, 3,852,765.
Erickson, Gustav F., to UMC Industries, Inc. Escrow stacker for paper currency. 3,851,744, Cl. 194-4.00r.
Erickson, Raymond Curry: *See*—
Dolfini, Joseph Edward; and Erickson, Raymond Curry, 3,852,283.
Erickson, Warren E.: *See*—
Holoubek, George Henry; Ales, David Edward; Harms, Harland Elmer; Erickson, Warren E.; Ditmars, Maurice A.; and Brookhart, J. Keith, 3,851,568.
Ericson, Douglas E.; and Hawley, Clyde A. Combined turbine and reciprocating piston engine. 3,851,475, Cl. 60-715.000.
Erikson, Uno Eugen: *See*—
Bjork, Lars; Erikson, Uno Eugen; Granath, Kirsti Annikki; Ingelman, Gustav-Adolf; and Lindberg, Bernt Jabes, 3,852,341.
Erlichman, Irving, to Polaroid Corporation. Variable drive for photographic apparatus. 3,852,781, Cl. 354-86.000.
Ernsthausen, Roger E.: *See*—
Hoehn, Harold J.; and Ernsthausen, Roger E., 3,852,607.
Eschholz, Harald, to Rockwell, Dick Gordon. Apparatus for application of resilient seals. 3,851,369, Cl. 29-211.00d.
Essex International, Inc.: *See*—
Vogel, Ralph A.; Anderson, Donald L.; Chattin, Robert A.; and Mosak, Joel L., 3,851,682.
Esso Research and Engineering Company: *See*—
Malatesta, Alberto, 3,852,253.
Estes, John H.: *See*—
Suggitt, Robert M.; Estes, John H.; and Kravitz, Stanley, 3,852,372.
Etablissement Wanderfield & Co.: *See*—
Filter, Walther, 3,851,678.
Etablissements Joints: *See*—
Baude, Lucien Louis, 3,851,559.
Etat Francais, represente par le Ministre d'Etat Charge de la Defense Nationale-Delegation Ministerielle pour l'Armement-Direction des Recherches et Moyens d'Essais: *See*—
Bellmann, Gunter Gert; Groult, Alain Maurice; and Arendt, John Harry, 3,852,239.
Eue, Ludwig: *See*—
Draber, Wilfried; Regel, Erik; Buchel, Karl Heinz; Eue, Ludwig; and Schmidt, Robert R., 3,852,056.
Evans, David: *See*—
Rogers, Edward J.; and Evans, David, 3,852,542.
Evans, Melvin W., to General Electric Company. Incandescent lamp and base. 3,852,631, Cl. 313-318.000.
Evans Products Company: *See*—
Stone, Thomas G., 3,851,597.
Eveleth, Jason H., to Isomet Corporation. High resolution laser beam recorder with self-focusing acousto-optic scanner. 3,851,951, Cl. 350-161.000.
Everett, Vernon M. Fuel induction system for internal combustion engine. 3,851,634, Cl. 123-133.000.
Ewan, Thomas K.: *See*—
Martin, Willis Leon; Holland, Orvis L.; Ewan, Thomas K.; and Hurse, James E., 3,852,409.
Ewan, Thomas K.; Holland, Orvis L.; Martin, Willis Leon; and Hurse, James E., to Lone Star Steel Company. Process for the removal of sulfur dioxide from carrier gases. 3,852,408, Cl. 423-242.000.
Exxon Research and Engineering Company: *See*—
Boggs, Jesse K., 3,852,368.
Dugan, John J.; and Higgins, James P., 3,852,188.
Lundberg, Robert D.; and Makowski, Henry S., 3,852,096.
Maness, Dale D., 3,852,411.
Robson, Harry E., 3,852,165.
Siskin, Michael; and Porcelli, Joseph J., 3,852,184.
Fahey, Dennis M., to PPG Industries, Inc. Method of coating glass fibers with a combined sizing and coating compositions. 3,852,051, Cl. 65-3.000.
Farbenfabriken Bayer Aktiengesellschaft: *See*—
Senning, Alexander; Buchholt, Hans Christian; Bierling, Robert; Steinhoff, Dieter; and Trossmann, Gerhard, 3,852,447.
Farha, Floyd, Jr.: *See*—
Walker, Darrell W.; Bertus, Brent J.; and Farha, Floyd, Jr., 3,852,369.
Farney, Wesley P. Sewing presser foot. 3,851,606, Cl. 112-235.000.
Farr, David Robert, to Societe d'Assistance Technique pour Produits Nestle S.A. Milk-clotting enzyme. 3,852,478, Cl. 426-42.000.
Fassbinder, Hans Georg: *See*—
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans Georg, 3,851,866.
Fassbinder, Hans George: *See*—
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans George, 3,852,062.
Fassell, W. Martin; and Bridges, Donald W., to Barber-Colman Company. Reactor for wet oxidation of organic matter. 3,852,192, Cl. 210-63.000.
Fassell, Wayne M., to Philco-Ford Corporation. Duplex sealing process. 3,852,124, Cl. 148-6.150.
Faubl, Hermann, to Pfizer Inc. Process for citric acid production and intermediates therefor. 3,852,322, Cl. 260-464.000.
Faulkner, Hubert D.: *See*—
Hecht, Richard M.; and Faulkner, Hubert D., 3,852,772.
Faulkner, John E.; Hansen, J. Richard; and Vaerewyck, Eugene G., to Westinghouse Electric Corporation. X-ray method and apparatus for detecting mislocation of steel reinforcements in green tires. 3,852,600, Cl. 250-360.000.
Fauran, Claude P.; Turin, Michel J.; Raynaud, Guy M.; and Gouret, Claude J., to Delalande S.A. Novel substituted oxamino(5,6,e)indoles. 3,852,284, Cl. 260-244.00r.
Fazzina, Thomas Laurence; McSweeney, Daniel Robert; and Gilmore, Gregory Jay, to General Foods Corporation. Process for imparting the taste, texture, and appearance of fat frying to foodstuffs which are baked. 3,852,501, Cl. 426-293.000.
Federspiel, Douglas M.: *See*—
Schlitt, Charles D.; and Federspiel, Douglas M., 3,851,549.
Fedosenko, Igor Grigorievich; Kononenko, Vadim Grigorievich; Lepetjukha, Vladimir Semenovich; and Vasilchenko, Lev Petrovich. Single shot riverting device. 3,851,713, Cl. 173-121.000.
Feinstein, Sumner Sheldon: *See*—
Davis, Willard Parker; Golner, Jerold Julius; and Feinstein, Sumner Sheldon, 3,852,392.
Feldman, Jacob R.; Hamell, Matthew; and Daneilczik, Eilen, to General Foods Corporation. Synthetic grinder gas aromas and processes. 3,852,481, Cl. 426-65.000.
Feldpush, Donald E.: *See*—
Reynard, Fred T.; Feldpush, Donald E.; and Schibinger, Joseph S., 3,852,581.
Felsenheld, Robert A.; and MacDonald, Copthorne, to International Telephone and Telegraph Corporation. Broadband tunable antenna. 3,852,759, Cl. 343-729.000.
Fernandez, John J. Fluid flow regulator and pressure indicator. 3,851,661, Cl. 137-558.000.
Ferrandini, Antoine R.: *See*—
Walker, Eugene L.; Ferrandini, Antoine R.; Walker, Eugene L.; Ferrandini, Antoine R.; and , 3,852,486.
Ferrandini, Suzanne W.: *See*—
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Ferro Manufacturing Corporation: *See*—
Pickles, Joseph; and Duckworth, Albert, 3,851,351.
Fiber Industries, Inc.: *See*—
Vizurraga, Louis, 3,852,247.
Fichter, Barry S.: *See*—
Parkison, Richard G.; and Fichter, Barry S., 3,851,825.
Field, Donald E.; and Griffith, James R., to United States of America, Navy. Fluorinated epoxy resins. 3,852,222, Cl. 260-2.0ep.
Fields, Jack W.; and Camp, Robert D., to Oxford Industries, Inc. Collar form and press apparatus. 3,851,807, Cl. 223-2.000.
Fillmore, A. Ray. Protective bed sheet. 3,851,346, Cl. 5-334.00r.
Filter, Walther, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft and Etablissement Wanderfield & Co. Filling thread transfer and clamping device. 3,851,678, Cl. 139-126.000.
Findley, Thomas W.; and Benner, John F., to Swift & Company. Method for controlling axillary shoots of tobacco plants. 3,852,057, Cl. 71-78.000.
Fine, Earl Yale: *See*—
Haymes, Irving, 3,852,740.
Fine, Harry Harold, to Schlegel Manufacturing Company. Can seal applier. 3,851,443, Cl. 53-139.300.
Fine, Steven: *See*—
Haymes, Irving, 3,852,740.
Fink, Trevor, to Jarva, Inc. Roller cutter. 3,851,718, Cl. 175-363.000.
Finke, Eugene D.: *See*—
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Finkle, Eugene D.: *See*—
Patterson, James A.; and Finke, Eugene D., 3,852,092.
Firestone Tire & Rubber Company, The: *See*—
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First Dynamics, Inc.: *See*—
Marchand, Jacques J., 3,851,441.
Fischer, William H.: *See*—
Kane, Richard E.; and Fischer, William H., 3,852,556.
Fisher, Howard M., to Pennsylvania Engineering Corporation. Bottom clamp for OBM vessels. 3,851,865, Cl. 266-35.000.
Fisher, James, to Parke, Davis & Company. New anthranilic acid - monoglycerides. 3,852,333, Cl. 260-471.00r.

Fitch, John L.; Masse, Lucien; Medlin, William L.; and Biot, Maurice A., to Mobil Oil Corporation. Hydraulic fracturing method to control vertical fracture heights. 3,851,709, Cl. 166-308.000.

Fitzgerald, Maurice J., to Polaroid Corporation. Silver halide emulsions comprising polymeric peptizers. 3,852,073, Cl. 96-114.000.

Fitzpatrick, Jimmie D.: *See—*
Heumann, Aubrey C., Jr.; Denton, Wayne L.; and Fitzpatrick, Jimmie D., 3,852,500.

Flagg, Willard A., Jr., to Ark-Les Switch Corporation. Stove warning device. 3,852,728, Cl. 340-227.00r.

Flahive, Richard G. Electrical wiring system. 3,852,513, Cl. 174-55.000.

Flay, Roy B., to Chevron Research Company. Process for preparing polyolefin substituted amines. 3,852,258, Cl. 260-93.700.

Fletcher, Robert H., Jr.; and Burlage, Donald W., to United States of America, Army. Digital MTI canceller apparatus using initialization. 3,852,742, Cl. 343-7.700.

Flider, Frank S., to Justrite Manufacturing Company. Plastic safety can for containing fires burning inflammable fluid inside the can. 3,851,791, Cl. 220-89.00b.

Flinner, Vaughn D.; Sprang, Richard W.; Zody, Dana D.; and Fulton, Howard A., to Mansfield Sanitary Inc. Portable, self-contained toilet. 3,851,339, Cl. 4-115.000.

Flint, Hans Gerhard: *See—*
Neitzel, Ulrich E. G.; Flint, Hans Gerhard; and Lukes, Jerome A., 3,852,044.

Flow Pharmaceuticals, Inc.: *See—*
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Horsky, Eugene G., 3,851,440.
Hsiao, Chao; and Horton, Lawrence B., 3,852,050.
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Foggiato, Giovanni A.: *See—*
Pearson, Gerald L.; and Foggiato, Giovanni A., 3,852,794.

Fohl, Artur. Winding-up device with automatic lock for safety belt. 3,851,835, Cl. 242-107.400.

Fonken, Gunther S.: *See—*
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Ford, Eric Harold, to Lumenition Limited. Fuel injection systems for internal combustion engines. 3,851,628, Cl. 123-32.0ea.

Forgo, Laszlo: *See—*
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Heller, Laszlo; Forgo, Laszlo; Bodas, Janos; Alekszejev, I. A.; and Agejev, G. Sz., 3,851,702.

Fork, Frank W., to Robertson, H. H., Company. Supplementary raceway for an underfloor electrical cable trench. 3,851,674, Cl. 138-173.000.

Forshtator, Georgy Mironovich: *See—*
Ljudmirsky, Mark Lipovich; Forshtator, Georgy Mironovich; and Shkurovich, Yakov Solomonovich, 3,852,815.

Forster, Denis; Hershman Arnold; and Paulik, Frank E., to Monsanto Company. Production of carboxylic acid anhydrides. 3,852,346, Cl. 260-546.000.

Foseco International Limited: *See—*
Lorkin, Clive Graham; and Schiffarth, Josef, 3,852,107.

Foster, James R., to Franklin Manufacturing Company. Washing machine pump. 3,851,993, Cl. 415-53.000.

Foster, Kenneth William; and Wallace, Neil McIntosh, to Renold Limited. Gear pumps. 3,852,004, Cl. 418-131.000.

Foster, Merrill J., to Marine Industries Incorporated. Rotary piston engine. 3,851,630, Cl. 123-44.00r.

Foster, Michael R.: *See—*
Moore, Albert J.; Haggart, James A., Jr.; and Foster, Michael R., 3,852,041.

Fox, Richard Q., to Westinghouse Electric Corporation. Rolling mill gauge control method and apparatus including speed correction. 3,851,509, Cl. 72-8.000.

Foy, Wade H.: *See—*
Toole, Joseph G.; and Foy, Wade H., 3,851,641.

Fracke, Aribert; Klein, Heinrich; Pieper, Rudolf; Weber, Eduard; and Wachtler, Hans, to Siemens Aktiengesellschaft. Apparatus for drying particulate matter with gaseous media. 3,851,404, Cl. 34-56.000.

Fraioli, Anthony Vincent, to American Cyanamid Company. Seal for electrochemical cells and the like. 3,852,117, Cl. 136-133.000.

Frankle, Helmut; and Schmalzriedt, Fritz, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Apparatus for varying sealing pressures on abutting wall parts, particularly of liquid fuel rocket engines from the exterior of such engines. 3,81,468, Cl. 60-258.000.

Franklin Manufacturing Company: *See—*
Foster, James R., 3,851,993.

Franz, Karl; Christgau, Hermann; and Stachowiak, Aribert, to Siemens Aktiengesellschaft. Photocathode having an intermediate layer between its carrier and its luminous layer. 3,852,632, Cl. 313-380.000.

Franz, Norman C. Means for sealing fittings and nozzle assemblies at extremely high fluid pressures. 3,851,899, Cl. 285-95.000.

Fraser, Sheila J.; Gillette, Roger B.; and Olson, Richard L., to Boeing Company, The. Sterilizing and packaging process utilizing gas plasma. 3,851,436, Cl. 53-21.0fc.

Fraze, Ermal C., mesne: *See—*
Brown, Omar L., 3,851,793.

Frazier, Garland D. Kicking toe. 3,851,410, Cl. 36-2.5al.

Frederickson, Lyle R.: *See—*
Wood, Robert L.; and Frederickson, Lyle R., 3,852,751.

Freedman, Nathan: *See—*
Works, George A.; Murray, John C.; and Freedman, Nathan, 3,852,755.

French, Tom, to Dunlop Limited. Pneumatic tires. 3,851,691, Cl. 152-353.000.

Fretwell, Richard D.: *See—*
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Fretwell, Richard D.; and Azbell, James W., to Design Elements, Inc. Answer-originate data communication system. 3,852,531, Cl. 179-2.0dp.

Fricko, John J., to General Motors Corporation. Pneumatic actuator control apparatus. 3,851,867, Cl. 267-120.000.

Fried, John H.; and Harrison, Ian T., to Syntex Corporation. Naphthyl acetaldehyde derivatives; method of use thereof; and processes for the preparation thereof. 3,852,363, Cl. 260-613.00d.

Friedman, Sam: *See—*
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Friedrichsen, Wilhelm: *See—*
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Frings, Gerd: *See—*
Kuife, Siegfried; Karla, Heinz; and Frings, Gerd, 3,851,368.

Frisch, Erling; and Andrews, Harry N., to Westinghouse Electric Corporation. Head closure system. 3,851,906, Cl. 292-256.730.

Fritz, Walter: *See—*
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Frohberger, Paul-Ernst: *See—*
Wagner, Klaus; Scheinpflug, Hans; and Frohberger, Paul-Ernst, 3,852,298.

Frye, George Joseph. Push-pull amplifier with current mirrors for determining the quiescent operating point. 3,852,678, Cl. 330-15.000.

Fuchs, Hugo: *See—*
Weitz, Hans Martin; Vogel, Hans-Henning; Kahr, Kurt; and Fuchs, Hugo, 3,852,356.

Fuji Photo Film Co., Ltd.: *See—*
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Fujii, Mitsuharu: *See—*
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Fujii, Tadashi: *See—*
Watanabe, Eiji; Kato, Eizo; Shimomura, Takayuki; Ito, Takashi; Nakamura, Koichiro; and Fujii, Tadashi, 3,852,605.

Fujimoto, Takehiko: *See—*
Miyabe, Yoshio; Fujimoto, Takehiko; Nukina, Shogo; and Suwada, Ataru, 3,852,249.

Fujisawa, Tamotsu; and Aiba, Michio, to Sagami Chemical Research Center. Tris-(3,5-di-t-butyl-4-hydroxyphenylthio) phosphine. 3,852,395, Cl. 260-953.000.

Fujisoku Electric Co., Ltd.: *See—*
Kimijima, Hiroatsu; Iizuka, Shohei; and Fujii, Hironao, 3,852,552.

Fujitsu Limited: *See—*
Morimoto, Naoki, 3,852,715.

Fukao, Masami: *See—*
Nagase, Tsuneyuki; Suzukamo, Gohu; and Fukao, Masami, 3,852,305.

Fukazawa, Nobuo: *See—*
Kudamatsu, Akio; Miyamoto, Masao; and Fukazawa, Nobuo, 3,852,318.

Fukuda, Katsuhiro: *See—*
Sano, Takao; Fukuda, Katsuhiro; Ando, Akio; and Tameno, Louzou, 3,851,448.

Fukuda, Susumu, to Fuji Photo Film Co., Ltd. Viewfinder mirror buffer device for a singlelens reflex camera. 3,852,791, Cl. 354-152.000.

Fulton, Howard A.: *See—*
Flinner, Vaughn D.; Sprang, Richard W.; Zody, Dana D.; and Fulton, Howard A., 3,851,339.

Furuichi, Itsuro: *See—*
Usamoto, Teruyoshi; Hatada, Yasutaka; Furuichi, Itsuro; and Matsuo, Masao, 3,852,354.

Furuichi, Masayoshi; Akiba, Nobuo; and Kudo, Seiichi, to Katsuragawa Denki Kabushiki Kaisha. Cleaning apparatus for electrocopying machines. 3,851,965, Cl. 355-15.000.

Furukawa, Kenji; Uyama, Hirofuji; Tsuchiya, Takashi; Kodo, Chikashi; and Torii, Keiichi, to Agency of Industrial Science & Technology. Fluidizing device. 3,851,405, Cl. 34-57.00a.

Furukawa, Shogi; Sonoyama, Yuzo; and Ohi, Akira, to Daicel Ltd. Resinous composition comprising a blend of an ABS resin and polycarbonate resin. 3,852,393, Cl. 260-873.000.

Furuya, Sachinori: *See—*
Seki, Hideki; Furuya, Sachinori; and Hiroyasu, Mamoru, 3,852,643.

Fyrk, Clas O. F., to Swenson Spreader and Mfg. Co. Apparatus for feeding material. 3,851,804, Cl. 222-413.000.

Gabler, Robert C., Jr.: *See—*
Leavenworth, Howard W., Jr.; Dunning, Beverly W., Jr.; Gabler, Robert C., Jr.; and Goldsmith, Carl E., 3,852,060.

Gabriel, Jean-Pierre Rene: *See—*

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Gaeumann, Ernst; deceased (by Gaeumann, Tino; legal representative); Prelog, Vladimir; Vischer, Ernst; and Bickel, Hans, to Ciba-Geigy Corporation. Purified ferrimycin and process for obtaining same. 3,852,424, Cl. 424-118.000.

Gaeumann, Tino: *See*—
Gaeumann, Ernst; Prelog, Vladimir; Vischer, Ernst; and Bickel, Hans, 3,852,424.

GAF Corporation: *See*—
Cooney, William J., 3,852,213.
Komor, Joseph A., 3,852,030.

Gagneux, Andre; Heckendorn, Roland; and Meier, Rene, to Ciba-Geigy Corporation. Certain 6-phenyl-4H-s-triazolo [1,5-2] [1,4-benzodiazepines]. 3,852,300, Cl. 260-308.00r.

Gagnon, Pierre; and Laforest, Pierre. Concrete block plant. 3,851,593, Cl. 104-88.000.

Gahwiler, Hermann, to Contraves AG. Method and apparatus for compensation of the temperature-dependency of the conductivity of a fluid with suspended particles. 3,852,666, Cl. 324-71.0cp.

Gaizauskas, Bronius: *See*—
Ganzert, Albert E.; Gaizauskas, Bronius; Andrychowski, Leonard; and Mina, Nabil, 3,851,944.

Gale, Wilfred Ernest. Punching machine. 3,851,553, Cl. 83-529.000.

Gall, Martin: *See*—
Hester, Jackson B., Jr.; and Gall, Martin, 3,852,461.

Gallagher, Gregory: *See*—
Baile, Clifton A.; Gallagher, Gregory; McLaughlin, Carol L.; and Webb, Robert Lee, 3,852,473.

Gallagher, John P.; Meyers, Robert M.; and Surg, Earl H., to Thiokol Corporation, mesne. Liquid polysulfide polymer glass-to-metal sealant composition. 3,852,214, Cl. 252-403.000.

Gamin, Leopoldo Lazaro: *See*—
Adler, Norman; and Gamin, Leopoldo Lazaro, 3,852,414.

Gange, Robert Allen; Nagle, Eugene Michael; and Steinmetz, Carl Charles, to RCA Corporation. Holographic thermoplastic memory system. 3,851,948, Cl. 350-3.500.

Gans, Werner A.: *See*—
Alchorn, Terence R.; Gans, Werner A.; and Mellana, William D., 3,851,587.

Ganzert, Albert E.; Gaizauskas, Bronius; Andrychowski, Leonard; and Mina, Nabil, to Akzona Incorporated. Current transformer connector. 3,851,944, Cl. 339-19.000.

G.A.O. Gesellschaft fur Automation und Organisation mbH: *See*—
Lamping, Wolfram, 3,851,602.

Garner, Kenneth Bishop; and Roberson, Lewis Shepherd, to Combustion Engineering, Inc. Metal working apparatus. 3,851,516, Cl. 72-256.000.

Garton, William Robert, to Molins Limited. Apparatus for dividing a continuous stream of articles into batches which may be placed in containers. 3,851,748, Cl. 198-34.000.

Garwood, William E.: *See*—
Chen, Nai Y.; and Garwood, William E., 3,852,189.

Garzia, Aldo, to Instituto Chemioterapics Italiano S.p.A. Method and composition for prophlaxis and treatment of cardiac disorders using 3,4,5-trimethoxybenzamido-alkanoic acids or salts thereof. 3,852,466, Cl. 424-318.000.

Gaynor, John Cornelius: *See*—
Sculati, Marvin Americo; and Gaynor, John Cornelius, 3,852,005.

Gearheart, John D.: *See*—
Brooks, Herbert; Gearheart, John D.; and Jones, John L., 3,851,960.

Gebhardt, Hans; Prahl, Franz; and Schorwerth, Mathias, to Knorr-Bremes GmbH. Brake shoe for railway vehicle disk brakes. 3,851,738, Cl. 188-244.000.

Gebr. Stober: *See*—
Stober, Paul, 3,851,534.

Gee, Minor E.: *See*—
Kellner, Raymond M.; and Gee, Minor E., 3,851,384.

Gehrie, Charles S., to Presto Lock Company; Division of Kidde, Walter, & Company, Inc. Combination lock. 3,851,507, Cl. 70-316.000.

General Cable Corporation: *See*—
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General Electric Company: *See*—
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General Instrument Corporation, mesne: *See*—
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General Motors Corporation: *See*—
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Georg Fischer Aktiengesellschaft: *See*—
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Georgia-Pacific Corporation: *See*—
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Gerbasi, Dennis P., to Xerox Corporation. Sorting apparatus for collating simplex and duplex copies. 3,851,872, Cl. 271-173.000.

Gerber, Arthur M.; and Walworth, Vivian K., to Polaroid Corporation. Photographic products and processes comprising synthetic nuclear isotopes. 3,852,072, Cl. 96-94.00r.

Getz, Marvin G.; Whitehurst, Gerald E.; and Walden, Gerald M., to Caterpillar Tractor Company. Muffler with insulated internal sound dispersing and absorbing chambers. 3,851,727, Cl. 181-50.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Beulker, Franz; Becker, Kunibert; Rosenberg, Harry; Wieblitz, Hans-Dieter; and Kuti, Joseph, 3,851,480.

Giaccone, Sylvester: *See*—
Barouh, Victor; Glenn, Robert; and Giaccone, Sylvester, 3,852,089.

Giacobbe, Thomas J.: *See*—
Edamura, Fred Y.; and Giacobbe, Thomas J., 3,852,319.

Giambazi, James D. Putter head. 3,851,877, Cl. 273-78.000.

Gickler, Alan E.: *See*—
Roberts, H. Evan; and Gickler, Alan E., 3,851,435.

Giddings & Lewis, Inc.: *See*—
Klabunde, Steven Eldor, 3,851,396.

Gifford, William E.; and Veltri, Enrico D., to General Electric Company. Gas separation and purification utilizing time sequenced flow through a pair of regenerators. 3,851,493, Cl. 62-13.000.

Gilbert, William A.; and Wedding, Leon E. Angular rise flotation gear. 3,851,348, Cl. 9-8.00r.

Giles, Ronald L.; and Wetherell, Daniel L., to General Electric Company. Control system for an electrical power line. 3,852,532, Cl. 179-2 00r.

Gill, Thomas R.; and Bailly, Daniel, to GS Equipment Company. Programmable hydraulic drive system for transporting articles. 3,851,766, Cl. 212-20.000.

Gillespie, George W.: *See—*
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Gillette, Roger B.: *See—*
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Gilmore, Gregory Jay: *See—*
Fazzina, Thomas Laurence; McSweeney, Daniel Robert; and Gilmore, Gregory Jay, 3,852,501.

Ginder, William F., Jr. Fluid logic systems, diaphragm valve and parts therefore. 3,851,851, Cl. 251-25.000.

Girgis, Mikhail M., to Uniroyal, Ltd. Preparation of thionamides. 3,852,287, Cl. 260-242.10t.

Girling Limited: *See—*
Camm, John James, 3,851,565.

Giudicelli, Don Pierre Rene Lucien; and Gabriel, Jean-Pierre Rene, to Synthelabo. Method of enhancing vincamine compositions. 3.852,453, Cl. 424-262.000.

Givaudan Corporation: *See—*
Nikawitz, Edward J.; Tavares, Robert F.; and Easter, William M., Jr., 3,852,219.

GKN Transmissions Limited: *See—*
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Pagdin, Brian Colin, 3,851,928.

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Breslow, Jeffrey D.; and Kramer, Norman, 3,851,875.
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Kaelin, Bette M., 3,851,419.

Glass, Marvin I.: *See—*
Barlow, Gordon A.; and Glass, Marvin I., 3,851,418.

Glaus, Heinrich; and Jeanmaire, David, to Strapex AG. Sealinng device. 3,851,683, Cl. 140-93.004.

Glaverbel S.A.: *See—*
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Glenn, Robert: *See—*
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Godfrey, Arthur W.: *See—*
Kablaoui, Mahmoud S.; Godfrey, Arthur W.; and Reid, Robert E., 3,852,205.

Godlewski, Robert B.; Harris, Robert D.; and Tinghitella, Michael J., to International Business Machines Corporation. Security document system and method. 3,852,088, Cl. 117-1.000.

Goldberg, Eugene P.: *See—*
Palermiti, Frank M.; Goldberg, Eugene P.; and Melton, Carl W., 3,851,584.

Goldberg, Soley: *See—*
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Golden, Michael G.: *See—*
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Goldsmith, Carl E.: *See—*
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Goldsmith, Jesse M.: *See—*
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Golner, Jerold Julius: *See—*
Davis, Willard Parker; Golner, Jerold Julius; and Feinstein, Sumner Sheldon, 3,852,392.

Goltz, Kurt, to Pennwalt Corporation. Sealing rinses for phosphate coatings on metal. 3,852,123, Cl. 148-6.140.

Good, Robert E., Jr.: *See—*
Roberts, Victor B.; Stephenson, Charles V.; and Good, Robert E., Jr., 3,852,713.

Goodwin, Edwin C., Jr., to Allis-Chalmers Corporation. Actuating mechanism for contact and blast valve unit. 3,852,548, Cl. 200-148.00f.

Goodwin, Edwin C., Jr., to Allis-Chalmers Corporation. Plug-in contact and blast valve unit. 3,852,549, Cl. 200-148.00r.

Goodyear Tire & Rubber Company, The: *See—*
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Maxey, Frank S., 3,852,251.
Wilson, Farris H., Jr.; and Slam, Thomas J., 3,852,350.

Goodyer, Samuel Michael; and Mulhall, John Leslie, to Lucas Electrical Company Limited, The. Housing for a road vehicle lamp. 3,852,586, Cl. 240-57.000.

Gordon, Arnold. Scaffold structure. 3,851,729, Cl. 182-36.000.

Gordon, Claude E. Product vending machine alarm. 3,852,737, Cl. 340-274.00r.

Goryainov, Vladimir Ivanovich; Kononov, Ivan Vasilievich; Maslennikov, Ivan Egorovich; Platonov, Vladimir Nikiforovich; and Popov, Vyacheslav Evgenievich. Pulsator for hydraulic systems controlling actuating mechanisms. 3,851,667, Cl. 137-624.140.

Gosney, William Milton; and Buehler, Martin George, to Texas Instruments, Incorporated. Metal-insulator-semiconductor structures having reduced junction capacitance and method of fabrication. 3,852,119, Cl. 148-1.500.

Gould Inc.: *See—*
Clement, Jack M., 3,852,568.

Gould, Lawrence P.: *See—*
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Gouret, Claude J.: *See—*
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Govaert, Leonardus Eduard: *See—*
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Grace, W. R., & Co.: *See—*
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Graham, Robert W.: *See—*
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Graham, William, to Glaxo Laboratories Limited. Slats of mono-O-substituted and O,O-diaryl substituted phosphoric acids and a nitrogen base. 3,852,295, Cl. 260-297.00p.

Gramm, Richard F.; and Walton, Philip W., to Nuclear-Chicago Corporation. Scintillation camera with rapid sequence imaging device. 3,852,602, Cl. 250-369.000.

Granath, Kirsti Annikki: *See—*
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Granges Engineering Aktiebolag: *See—*
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Granquist, William T., to NL Industries, Inc. Laminar heavy metal aluminosilicates. 3,852,405, Cl. 423-118.000.

Grasko, Stephen Charles, to Ryan, John W. Aqueous method of microencapsulation and capsules. 3,852,076, Cl. 106-26.000.

Grava, Ilze Yanovna: *See—*
Polis, Yanis Jurievich; and Grava, Ilze Yanovna, 3,852,352.

Grazen, Frank S.: *See—*
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Great Salt Lake Minerals & Chemical Corporation: *See—*
Neitzel, Ulrich E. G.; Flint, Hans Gerhard; and Lukes, Jerome A., 3,852,044.

Green, Raymond J., to General Motors Corporation. Clamp assembly. 3,851,849, Cl. 248-503.000.

Green, Sam J., to Champion Spark Plug Company. Spark plug with glow plug. 3,851,637, Cl. 123-169.0pb.

Greene, Leonard M., to Safe Flight Instrument Corporation. Altitude alerting instrument. 3,852,711, Cl. 340-27.00r.

Greene, Leonard N., to Safe Flight Instrument Corporation. Device for selectively preventing rotation of the upper end of a reefed sail and particularly a head sail such as a jib. 3,851,610, Cl. 114-106.000.

Greenleaf, Jack T., to General Motors Corporation. Process for manufacturing curved channeled members. 3,851,517, Cl. 72-352.000.

Greer, Frances A., to International Minerals & Chemical Corporation. Resin acid modified oilseed meal. 3,852,499, Cl. 426-93.000.

Gregornik, Norman W.; and Swanson, Frank D., to Honeywell Inc. Low temperature epoxy resin curing agent comprising blend of an anhydride mixture, an anhydride half ester, and uranyl salt. 3,852,245, Cl. 260-59.000.

Gregory, Derek P., to SKF Industrial Trading and Development Company B.V. Apparatus for CO_2 conversion to methane. 3,852,180, Cl. 204-277.000.

Greiner, William A., Jr., to Armstrong Cork Company. Tube end coater. 3,851,620, Cl. 118-50.000.

Grengg, Walter M., to Pollution Control Technology, Inc. Mercury analysis system and method. 3,852,604, Cl. 250-373.000.

Grenot, Bernard: *See—*
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Griffin, Henry W., to General Motors Corporation. Motor vehicle window molding. 3,851,432, Cl. 52-400.000.

Griffin, Henry W., to General Motors Corporation. Vehicle occupant restraint belt retractor. 3,851,837, Cl. 242-107.400.

Griffith, James R.: *See—*
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Dumitru, Ion D.; Grigoras, Victor A.; Turtureanu, Mircea Ioan T.; Stancio, Doina Ecaterina G.; and Anescu, Vasile V., 3,851,406.

Grimm, William L., to International Harvester Company. Hydraulic beaming control system for plow implements. 3,851,710, Cl. 172-294.000.

Grisar, Johann Martin; and MacKenzie, Robert Douglas, to Richardson-Merrell Inc. Diphenylalkyllactamimide derivatives. 3,852,269, Cl. 260-239.00b.

Griswold, Edward A. Electrostatic filtering for cleaning dielectric fluids. 3,852,178, Cl. 204-186.000.

Groening, Harvey F.; and Hensler, Paul L., to FMC Corporation. Method of producing hydrated sodium tripolyphosphate composition. 3,852,212, Cl. 252-135.000.

Groesbeck, Charles W.: *See—*

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Grohe, Klaus; Kaspers, Helmut; and Scheinpflug, Hans, to Bayer Aktiengesellschaft. Dihalocyclopentenedione fungicidal and bactericidal agents. 3,852,470, Cl. 424-331.000.

Grose, Ronald D., to Northern Natural Gas Company. Noise suppressor. 3,851,726, Cl. 181-50.000.

Gross, Heinz; Wade, Harry C.; and Witts, John W. Method for producing helical seam welded steel. 3,851,376, Cl. 29-477.300.

Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Crash responsive motor mounting. 3,851,722, Cl. 180-82.00r.

Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Vehicle with flat frame structure. 3,851,912, Cl. 296-35.00r.

Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Braking mechanism tending to eliminate locking. 3,851,929, Cl. 303-21.00f.

Grosseau, Albert, to Braking mechanism having an anti-locking system. . 3,851,930, Cl. 303-21.00f.

Grothoff, Hans. Sure spray for aerosol caps and dispensers. 3,851,803, Cl. 222-182.000.

Groult, Alain Maurice: *See—*
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Grubb, Larry M.; and Baxter, James K. Tick and flea collar of solid solution plasticized vinylic resin-carbamate insecticide. 3,852,416, Cl. 424-14.000.

Grundvig, C.; and Thorvaldsen, B., to Moller Coates A/S and Presisjon Mek. Verksted A/S. Road marker. 3,851,615, Cl. 116-63.00r.

Grunert, Kurt A.; Paton, Charles R.; and Sentak, John A., to Westinghouse Electric Corporation. Fluid operated electrical contactor with contact coolant means. 3,852,544, Cl. 200-82.00r.

Gruppo Lepetit S.p.A.: *See—*
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Gryncewicz, Bronislaus. Seal structure. 3,851,784, Cl. 215-344.000.

GS Equipment Company: *See—*
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GTE Automatic Electric Laboratories, Incorporated: *See—*
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GTE Sylvania Incorporated: *See—*
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Risley, Curtis A., 3,852,671.

Guglielmi, Nicolo; Vittone, Settimo; and Rolando, Gianfranco, to Olivetti, Ing., C., & C., S.p.A. Zinc oxidation process. 3,852,172, Cl. 204-56.000.

Guida, Robert F. Water-purifying attachment for boats. 3,852,378, Cl. 261-4.000.

Guillot, Edmond P.: *See—*
Benoit, Roland A.; and Guillot, Edmond P., 3,851,345.

Gulf Oil Canada Limited: *See—*
Peczeli, Charles F.; and Tyrcz, Edward T., 3,852,020.

Gulf Research & Development Company: *See—*
Christman, Robert D.; McKinney, Joel D.; Readal, Thomas C.; and Yanik, Stephen J., 3,852,185.
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Meyer, W. Keith, 3,852,200.

Gumlich, Geert. Continuously variable transmission. 3,851,545, Cl. 74-751.000.

Gundlach, Robert W.; and Bean, Lloyd F., to Xerox Corporation. Imaging system. 3,852,782, Cl. 354-110.000.

Gunnebo Bruks Aktiebolag: *See—*
Engstrom, Per Ingemar; and Boye, Erhard Rudolf, 3,851,416.

Gunther, Donald A., to American Sterilizer Company. Indicator for effectiveness of ethylene oxide sterilization. 3,852,034, Cl. 23-232.00r.

Gupta, Radha Raman, to Bendix Corporation, The. Homodyne doppler radar with increased target sensitivity. 3,852,743, Cl. 343-8.000.

Gurevich, Vladimir Samuilovich: *See—*
Zhuravlev, German Alexandrovich; Roslivker, Efim Grigorievich; Chilevich, Eduard Mikhailovich; and Gurevich, Vladimir Samuilovich, 3,851,512.

Gustavsson, Karl Axel Goran, to Aktiebolaget Bahco Ventilation. Apparatus for removing undesirable substances from flue gas or the like. 3,852,040, Cl. 23-284.000.

Gutknecht, Peter; Heng, Terrence M. S.; and Nathanson, Harvey C., to Westinghouse Electric Corporation. Solid state components. 3,851,379, Cl. 29-571.000.

Guyot, Volker; Holdinghausen, Paul; and Mueller, Martin, to Schenck, Carl, AG. Method and circuit arrangement for producing and transmitting electrical reference pulses. 3,852,673, Cl. 328-127.000.

Gyugyi, Laszlo; and Stacey, Eric J., to Westinghouse Electric Corporation. Cycloconverter system including means to derive a control signal representing fundamental converter output. 3,852,654, Cl. 321-7.000.

H. B. Contracting Ltd.: *See—*
Berg, Harry, 3,851,856.

Haas, Hans; Sperber, Heinrich; and Friedrichsen, Wilhelm, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of formaldehyde. 3,852,361, Cl. 260-603.00c.

Haas, Karl-Heinz: *See—*
Kraft, Winfried; Wasmund, Heiko; and Haas, Karl-Heinz, 3,851,949.

Haas, William M.; and Merzlak, Richard P. Device for collecting, containing and dispensing markers for games. 3,851,656, Cl. 133-5.00a.

Habermeier, Juergen; and Porret, Daniel, to Ciba-Geigy Corporation. Diacrylic acid ester derivatives of hydantoin compounds. 3,852,302, Cl. 260-309.500.

Habib, Robert. Machine tool. 3,851,563, Cl. 90-11.500.

Haga, Kyosuke: *See—*
Nishumura, Hideo; and Haga, Kyosuke, 3,852,719.

Hagedorn, Ilse, to Merck Patent Gesellschaft mit beschrankter Haftung. Bis-quaternary pyridinium salts. 3,852,294, Cl. 260-296.00m.

Haggart, James A., Jr.: *See—*
Moore, Albert J.; Haggart, James A., Jr.; and Foster, Michael R., 3,852,041.

Hahn, Robert Erick: *See—*
Magnino, Pete Joseph; Hozr, Ralph Anthony; and Hahn, Robert Erick, 3,852,503.

Hajos, Zoltan George, to Hoffmann-La Roche Inc. Stereospecific total steroidal synthesis via substituted C/D-Trans indanones. 3,852,331, Cl. 260-468.00g.

Hale, John Richard, to RCA Corporation. Fabrication of dark heaters. 3,852,105, Cl. 117-217.000.

Hall, Bruce Wood; and Shade, Michael J., to Hempstead Bank. System of transferral of funds. 3,852,571, Cl. 235-61.70b.

Hall, Charles M.; and Wechter, William J., to Upjohn Company, The. Dihydroindane carboxylic acid cyclohexadiene acetic acids, esters and salts. 3,852,286, Cl. 260-247.20r.

Hall, Chester G.: *See—*
Le Tourneau, Richard L.; and Hall, Chester G., 3,851,482.

Hall, John B.; and Sanders, James Milton, to International Flavors & Fragrances, Inc. Processes for reacting di-substituted dienophiles with cyclopentadiene. 3,852,358, Cl. 260-586.00g.

Hall, Stanley D.: *See—*
Waldrop, Thomas E.; and Hall, Stanley D., 3,851,437.

Ham, Allan Leslie: *See—*
Augstein, Joachim; Alexander, David; and Ham, Allan Leslie, 3,852,291.

Hamada, Koichi; and Kunieda, Tatsuya, to Nippon Seisen Co., Ltd. Antistatic yarn consisting of a mixture of metallic and nonmetallic fibers. 3,851,456, Cl. 57-140.0by.

Hamanaka, Hiroyoshi; Okazaki, Yasuhisa; and Yoshijima, Hiroshi, to Toho Chemical Industry Co., Ltd. Surface-active organoboron compounds. 3,852,314, Cl. 260-410.700.

Hamano, Etsuko: *See—*
Takemura, Satoshi; Harakon, Katsuyuki; Maeda, Mitsuaki; Sakai, Noboru; and Hamano, Etsuko, 3,851,692.
Takemura, Satoshi; Harakon, Katsuyuki; Maeda, Mitsuaki; Sakai, Noboru; and Hamano, Etsuko, 3,851,693.

Hamel, Richard G.: *See—*
White, Marvin H.; O'Sullivan, David D.; and Hamel, Richard G., 3,851,531.

Hamell, Matthew: *See—*
Feldman, Jacob R.; Hamell, Matthew; and Daneilczik, Eilen, 3,852,481.

Hamilton, William F.: *See—*
Russell, Harold D.; Stone, Gerald; Lin, James; Hamilton, William F.; and Royston, James Allen, 3,852,789.

Hammes, Wilhelm. Plastic drum with removalbe cover and locking ring. 3,851,788, Cl. 220-319.000.

Hammond, Harry H., to Hansen Manufacturing Company, The. Coupling assembly. 3,851,666, Cl. 137-614.040.

Hampl, Edward F., Jr., to Minnesota Mining and Manufacturing Company. Thermoelectric composition. 3,852,118, Cl. 136-238.000.

Hanacek, Josef: *See—*
Miculka, Zdenek; Janirek, Vladislav; Rektorik, Vladimir; and Hanacek, Josef, 3,851,414.

Hankins, Thomas: *See—*
Cummins, Millard M.; Best, Robert G.; and Hankins, Thomas, 3,851,861.

Hanotier, Jacques D. V., to Labofina S.A. Process for the liquid phase oxidation of methylaromatic compounds into polycarboxylic acids. 3,852,342, Cl. 260-524.00r.

Hanotier, Jacques D. V.; and de Radzitzky d'Ostrowick, Pierre M.J.G., to Labofina S.A. Process for the production of benzene carboxylic acids from ethyl substituted benzenes. 3,852,343, Cl. 260-524.00r.

Hanscom, Genevieve I.: *See—*
Lazzarini, Louis P., 3,851,572.
Lazzarini, Louis P.; and Smith, Traner J., 3,851,753.

Hanscom, Genevieve I.; formerly Magnuson, Genevieve I.: *See—*
Lazzarini, Louis P.; and Smith, Traner J., 3,851,753.

Hansen, J. Richard: *See—*
Faulkner, John E.; Hansen, J. Richard; and Vaerewyck, Eugene G., 3,852,600.

Hansen Manufacturing Company, The: *See—*
Hammond, Harry H., 3,851,666.

Hara, Kazuo: *See—*
Bando, Satoshi; Hara, Kazuo; Yoshitake, Toshihiko; and Tasaka, Takeo, 3,852,376.

Harakon, Katsuyuki: *See—*
Takemura, Satoshi; Harakon, Katsuyuki; Maeda, Mitsuaki; Sakai, Noboru; and Hamano, Etsuko, 3,851,692.
Takemura, Satoshi; Harakon, Katsuyuki; Maeda, Mitsuaki; Sakai, Noboru; and Hamano, Etsuko, 3,851,693.

Hardenbrook, James M.; and Andrus, Paul G., to Xerox Corporation. Electrometer system. 3,852,668, Cl. 324-72.000.

Hardies, Donald E.; and Rinehart, Jay K., to PPG Industries, Inc. Miticidal fluorinated carbonates. 3,852,464, Cl. 424-301.000.

Hare, Clarence R.: *See—*
Williams, Bruce T.; and Hare, Clarence R., 3,852,667.

Harfenist, Morton, to Burroughs Wellcome Co. Anthelmintic compounds. 3,852,336, Cl. 260-485.00j.

Harich, Jakob, to Rush-Hampton, Inc. Biocidal compositions and their method of preparation employing a grapefruit derivative. 3,852,436, Cl. 424-195.000.

Harken, Russel D.: *See—*
Rapko, John N.; and Harken, Russel D., 3,852,306.

Harms, Harland Elmer: *See—*
Holoubek, George Henry; Ales, David Edward; Harms, Harland Elmer; Erickson, Warren E.; Ditmars, Maurice A.; and Brookhart, J. Keith, 3,851,568.

Harris, Edward M.: *See—*
Parker, Edward H.; Harris, Edward M.; and Meador, Jim D., 3,852,256.

Harris, Everett K.; Anderson, William P.; and Lannert, James W., to All-Steel Inc. Shell chair construction. 3,851,920, Cl. 297-455.000.

Harris, Guy H.; and Collins, David J., to Dow Chemical Company, The. Flotation of nickel sulfide ores. 3,852,167, Cl. 209-166.000.

Harris, Robert D.: *See—*
Godlewski, Robert B.; Harris, Robert D.; and Tinghitella, Michael J., 3,852,088.

Harris-Intertype Corporation: *See—*
Norton, Robert K., 3,851,583.

Harrison, Ian T.: *See—*
Fried, John H.; and Harrison, Ian T., 3,852,363.

Harrison, James M., to Crest Container Corporation. Method for filling thin wall cup cavities with plastic beads. 3,852,390, Cl. 264-53.000.

Harrison, William A.: *See—*
Ariyan, Zaven S.; and Harrison, William A., 3,852,293.

Hart, Alan M.: *See—*
Skelcey, James S.; Richards, David W.; and Hart, Alan M., 3,852,497.

Hart, Joseph I.: *See—*
Desmond, John D.; and Hart, Joseph I., 3,851,815.

Hartenstein, Johannes Hermann; and Stazinger, Gerhard, to Warner-Lambert Company. 2',3'-O-lower alkylidene or cyclohexylidene periplorhamnoside compounds. 3,852,265, Cl. 260-210.500.

Hartnek, Henry G.; Empey, Richard A.; Pettitt, David J.; and Van Winkle, Terry L., to Kelco Company. Suspension polymerization in the presence of xanthan gum. 3,852,257, Cl. 260-89.5aw.

Hasegawa, Ryoichi: *See—*
Kubota, Hiroaki; Nakamura, Yoshithugu; and Hasegawa, Ryoichi, 3,852,394.

Hasker, Jan: *See—*
Johanns, Johannes Hendricus Maria; and Hasker, Jan, 3,852,608.

Hasselberg, Sven Rudolf Gunnar, to Brody Industrier AB. Furnace for the combustion of waste liquors or other solutions or suspensions containing combustible organic substance and various combinations with alkali. 3,852,039, Cl. 23-277.00r.

Hastwell, Peter John: *See—*
Smith, Ian Edward; Hastwell, Peter John; and Vermeulen, Marinus Cornelus, 3,851,964.

Hatada, Yasutaka: *See—*
Usamoto, Teruyoshi; Hatada, Yasutaka; Furuichi, Itsuro; and Matsuo, Masao, 3,852,354.

Haugwitz, Rudiger D.; and Narayanan, Venkatachala L., to Squibb, E. R., & Sons, Inc. Enol betaines of imidazoles. 3,852,301, Cl. 260-309.000.

Haus, Hans. Copying machine with traveling light source. 3,851,969, Cl. 355-132.000.

Hausler, Dietrich: *See—*
Kassel, Walter Dopper; Hausler, Dietrich; and Kohler, Walter, 3,851,829.

Hautau, Charles F. Apparatus for cutting or deforming a workpiece. 3,851,515, Cl. 72-121.000.

Hawkes, George R.; Hodgson, Clive; Reed, Marion G.; and Toland, William G., to Chevron Research Company. Noncaking fertilizers. 3,852,055, Cl. 71-59.000.

Hawley, Clyde A.: *See—*
Ericson, Douglas E.; and Hawley, Clyde A., 3,851,475.

Haws, Edward Leon, to Breston, Michael P., mesne. Grounding base for connector. 3,852,700, Cl. 339-14.00r.

Hawthorne, Vaughn T., to Keystone Industries, Inc. Filling means for an impact absorbing device. 3,851,768, Cl. 213-43.000.

Haymes, Irving, 1/5 to Fine, Earl Yale, 1/5 to Goldberg, Soley and 1/5 to Fine, Steven. Alarm system with radio alarm link and equipment activating power line link. 3,852,740, Cl. 340-416.000.

Hazard, Robert E., to Polytop Corporation. Child-resistant closures with limited spout assessibility. 3,851,805, Cl. 222-534.000.

Hazbun, Eddy A.: *See—*
Bortnick, Newman M.; White, James W.; and Hazbun, Eddy A., 3,852,387.

Heaphy, Clifford John. Oral hypoglycemic aminophenylsulfonylhydrocarbylbiguanides. 3,852,353, Cl. 260-564.00b.

Heath, Darrell R.; and Wirth, Joseph G., to General Electric Company. Polyetherquinoxalines. 3,852,244, Cl. 260-50.000.

Hebert, David M.: *See—*
Case, Charles B.; Hebert, David M.; Olson, Maylin J.; and Schubert, John C., 3,851,789.

Hecht, Richard M.; and Faulkner, Hubert D., to Recognition Equipment. Mechanically cycled ink jet printer. 3,852,772, Cl. 346-75.000.

Heckendorn, Roland: *See—*
Gagneux, Andre; Heckendorn, Roland; and Meier, Rene, 3,852,300.

Hectors, Adrianus Marie Petrus, to Oce-van der Grinten N.V. Photoconductive bisphenyl thiocompounds linked by bridging organic group. 3,852,065, Cl. 96-1.400.

Hedrick, John R., to Pevrick Engineering Co., Inc. Air operated tool. 3,851,715, Cl. 173-170.000.

Heetco Ltee: *See—*
Potvin, Alfred M., 3,852,569.

Hehl, Karl. Injection molding machine with optional pivotable support frame. 3,852,010, Cl. 425-192.000.

Hehl, Klaus Friedrich, to ITW-ATECO G.m.b.H. Expansible holeplug with seal. 3,851,794, Cl. 220-308.000.

Heide, Stanford M., to Chicago Dyanmic Industries, Inc. Bidirectional rotary push-button switch. 3,852,554, Cl. 200-156.000.

Heilman, William J., to Gulf Research & Development Company. Homogeneous thermosettable composition of a polyanhydride and a polyepoxide. 3,852,236, Cl. 260-42.018.

Heintzelman, Leo; and Roy, Albert G. Spit-back for carburators. 3,852,377, Cl. 261-1.000.

Helfenberger, Hans, to Sandoz Ltd. Stable pesticidal compositions. 3,852,437, Cl. 424-200.000.

Heller, Laszlo; Forgo, Laszlo; and Bakay, Arpad, to TRANSELEKTRO Magyar Villamossagi Kulkereskedelmi Vallalat. Steam turbine power plant, more particularly atomic power station. 3,851,474, Cl. 60-644.000.

Heller, Laszlo; Forgo, Laszlo; Bodas, Janos; Alekszejev, I. A.; and Agejev, G. Sz., to Tyeploelektroprojekt and Energiagazdalkodasi Intezet. Condensation apparatus for steam turbine plants. 3,851,702, Cl. 165-110.000.

Hempstead Bank: *See—*
Hall, Bruce Wood; and Shade, Michael J., 3,852,571.

Henf, George; and Schwartz, Leonard, to Singer Company, The. Scanning lens antenna. 3,852,762, Cl. 343-756.000.

Heng, Terrence M. S.: *See—*
Gutknecht, Peter; Heng, Terrence M. S.; and Nathanson, Harvey C., 3,851,379.

Henick, Albert S.: *See—*
Bishov, Solomon J.; and Henick, Albert S., 3,852,502.

Henkin, Robert I., to United States of America, Health, Education and Welfare. Diagnostic device and method of treatment. 3,852,432, Cl. 424-145.000.

Hennart, Claude; and Dulat, Marcel Louis, to Ciba-Geigy AG. Compositions with a base of phosphoric esters combined with a stabiliser. 3,852,439, Cl. 424-219.000.

Hennel, Allan K.: *See—*
Boyd, John; and Hennel, Allan K., 3,851,626.

Henning, Richard: *See—*
Mayr, Bertold; Henning, Richard; and Schweiger, Erwin, 3,851,629.

Henrickson, Gary C.; and McDonald, John C., to Vidar Corporation. Sampling and analog-to-digital converter apparatus for use in a telephone message metering system. 3,852,533, Cl. 179-8.00a.

Henry, Arnold W.: *See—*
Vander Ploog, Cornelius J.; Henry, Arnold W.; and Connolly, Franklin J., 3,852,516.

Hensler, Paul L.: *See—*
Groening, Harvey F.; and Hensler, Paul L., 3,852,212.

Hepke, John V.: *See—*
De Vincent, Patsy; and Hepke, John V., 3,851,672.

Heraeus-Schott Quarzschmelze GmbH: *See—*
Schulke, Karl A., 3,851,785.

Herbots, Joseph Antoine: *See—*
Van Paesschen, August Jean; and Herbots, Joseph Antoine, 3,852,069.

Hercules Incorporated: *See—*
Daly, James Ernest, 3,852,404.

Hergenrother, Paul M., to Boeing Company, The. Polyphenylquinoxalines containing latent crosslinking groups. 3,852,243, Cl. 260-50.000.

Herman, Stanley W., to General Motors Corporation. Transmission with torque converter and hydrostatic drives. 3,851,544, Cl. 74-677.000.

Hernandex, Ralph, Jr., to Aircraft Instruments, Inc. Aircraft gyrohorizon indicator with signal lamp positional attitude indicating means. 3,852,710, Cl. 340-27.0at.

Herrmann, Henry Otto, Jr., to AMP Incorporated. High voltage corona-free wire termination. 3,852,512, Cl. 174-19.000.

Herrmann, Walter, to Bosch, Robert, G.m.b.H. Apparatus for controlling a hydraulic-lift tail gate arrangement of a cargo-carrying vehicle. 3,851,566, Cl. 91-411.00r.

Hershman Arnold: *See—*
Forster, Denis; Hershman Arnold; and Paulik, Frank E., 3,852,346.

Hess, Jurgen: *See—*
Adalbert, Gerhard; Hess, Jurgen; and Linder, Ernst, 3,852,003.

Hess, Jurgen, to Bosch, Robert, G.m.b.H. Motor vehicle cooling system with by pass regulated heat exchanger. 3,851,494, Cl. 62-196.000.

Hesse, Earl J.; Cimperman, Frederick J.; and Severson, Howard B., to Vistan Corporation. Cherry stemming machine. 3,851,573, Cl. 99-640.000.

Hesse, Karl-Dieter; and Von Portatius, Hans, to Chemische Werke Huls Aktiengesellschaft. Process for the production of liquid butadiene polymers. 3,852,373, Cl. 260-680.00b.

Hester, Howard D.; and Wanlass, Bert R., to General Motors Corporation. Telescopic counterbalance. 3,851,908, Cl. 292-262.000.

Hester, Jackson B., Jr.; and Gall, Martin, to Upjohn Company, The. Benzodiapines used as minor tranquilizers. 3,852,461, Cl. 424-273.000.

Heumann, Aubrey C., Jr.; Denton, Wayne L.; and Fitzpatrick, Jimmie D., to Mr. Crawfish, Inc. Preservation of crawfish meat with hepatopancreatic crawfish distillate. 3,852,500, Cl. 426-151.000.

Hewins, James A., to General Motors Corporation. Disc brake with automatic adjusting parking brake. 3,851,737, Cl. 188-71.900.

Hewlett-Packard Company: *See—*
Bohorquez, Jaime H.; and MacNeil, Norman H., 3,852,563.
Justice, Gregory, 3,852,655.

Heybourne, Robert Howard. Synchronous self-shifting toothed clutch. 3,851,740, Cl. 192-67.00a.

Heynisch, Hinrich, to Siemens Aktiengesellschaft. Transit-time amplifier tube with stabilized delay. 3,852,635, Cl. 315-3.500.

Hi-Shear Corporation: *See—*
Wing, George S.; and Bochman, Harry L., Jr. (said Bochman, Jr., assor. to), 3,851,690.

Hibberd, Barry Reginald; and Standing, David Talbot. Cylinder containing manually operable piston for cleaning spray nozzle passages with air blast. 3,851,352, Cl. 15-341.000.

Hibbs, Louis E., Jr.; Darrow, Kenneth A.; and Reed, William R., Jr., to General Electric Company. Vitreous-bonded cubic boron nitride abrasive grinding system. 3,852,049, Cl. 51-308.000.

Hickman, Jack. Vehicle transfer means. 3,851,591, Cl. 104-20.000.

Hicks, Alan A., to Glass, Marvin, & Associates. Game device with selectively movable panel structure. 3,851,879, Cl. 273-120.00r.

Higgins, James P.: *See—*
Dugan, John J.; and Higgins, James P., 3,852,188.

Hilburger, Walter, to Metabowerke KG Closs, Rauch & Schnizler. Gear test apparatus. 3,851,398, Cl. 33-179.50b.

Hildebrandt, Hans-Joachim: *See—*
Ploss, Helmut; and Hildebrandt, Hans-Joachim, 3,851,541.

Hilder, Martin Hugh: *See—*
DeGroot, Willem Herman; and Hilder, Martin Hugh, 3,852,315.

Hill, Ada: *See—*
Roelofs, Wendell; Comeau, Andre; and Hill, Ada, 3,852,419.

Hilpert, Conrad R.: *See—*
Schneider, Kurt A.; Adams, Leonard H.; and Hilpert, Conrad R., 3,851,739.

Hilti Aktiengesellschaft: *See—*
Tauern, Dankmar,, 3,852,559.

Hinkley, Robert L. Spark plug holder for motorcycles and the like. 3,851,847, Cl. 248-231.000.

Hinkson, Robert E.; and Taylor, William H., to Petro-Tex Chemical Corporation. Oxidative dehydrogenation with promoted barium ferrite catalysts. 3,852,370, Cl. 260-680.00e.

Hiroyasu, Mamoru: *See—*
Seki, Hideki; Furuya, Sachinori; and Hiroyasu, Mamoru, 3,852,643.

Hisatomi, Takashi; and Sasaki, Kenichi, to Nissan Motor Company, Limited. Carburetor with deceleration circuit. 3,852,391, Cl. 261-69.00r.

Hitachi, Ltd.: *See—*
Itoh, Yokichi; Sunami, Hideo; and Kamigaki, Yoshiaki, 3,852,801.
Kubo, Masaharu, 3,852,625.
Kuroda, Kazusuke; Naoi, Keigo; and Minorikawa, Hitoshi, 3,852,653.
Yamazaki, Eiichi; and Kanai, Hiromi, 3,852,637.

Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
Itoh, Takusen; Onose, Kenji; Ueda, Takayoshi; Okigami, Noboru; and Miyabayashi, Iwao, 3,852,023.

Hitchcock, David B.; and Laurie, James L. Chess game board. 3,851,883, Cl. 273-131.00b.

Hixon, Harvey Walker. Formwork system. 3,851,850, Cl. 249-194.000.

Hjerl, Jonna. Bib. 3,851,336, Cl. 2-49.00r.

Hobart Manufacturing Company, The: *See—*
Engebretsen, Einar O., 3,851,578.

Hodges, Paul, to International Business Machines Corporation. High rate digital modulation/demodulation method and means. 3,852,687, Cl. 332-11.00r.

Hodgson, Clive: *See—*
Hawkes, George R.; Hodgson, Clive; Reed, Marion G.; and Toland, William G., 3,852,055.

Hodkinson, Harold: *See—*
Bainbridge, Wilfred Nicholas; Parsons, David; and Hodkinson, Harold, 3,851,473.

Hoechst Aktiengesellschaft: *See—*
Stroszynski, Joachim, 3,851,421.

Hoehn, Harold J.; and Ernsthausen, Roger E., to Owens-Illinois, Inc. Multiple gaseous discharge display/memory panel having thin film dielectric charge storage member. 3,852,607, Cl. 313-201.000.

Hoekje, Howard H., to PPG Industries, Inc. Electrodes having silicon base members. 3,852,175, Cl. 204-98.000.

Hoffman, Robert J.; and Gould, Lawrence P., to Allied Chemical Corporation. Sodium bicarbonate spherulites from sodium D esquicarbonate. 3,852,427, Cl. 423-422.000.

Hoffman, Stanley A.; and Paxton, David J. Method for photographing a set of varying contrast radiographic X-rays. 3,851,968, Cl. 355-132.000.

Hoffmann-La Roche Inc.: *See—*
Hajos, Zoltan George, 3,852,331.
Kaiser, Ado; Koch, Wolfgang; Scheer, Marcel; and Wolcke, Uwe, 3,852,338.
Leimgruber, Willy; Paestrone, Gian Paolo; and Mitrovic, Milan, 3,852,442.
Vandervoorde, Jacques Pierre, 3,852,415.

Hofman, Gerard L.; and Hudman, Gary D., to United States of America, Atomic Energy Commission. Maximum temperature monitor. 3,851,527, Cl. 73-368.000.

Hofmann, Friedrich: *See—*
Lienau, Rainer; and Hofmann, Friedrich, 3,852,430.

Hofmann, Patricia A., to Colgate-Palmolive Company. Non-phosphate automatic dishwasher detergent. 3,852,209, Cl. 252-95.000.

Hofsass, Dieter: *See—*
Zellbeck, Gustav; Bertsch, Dieter; and Hofsass, Dieter, 3,851,669.

Hogstrom, Edwin F., to Nordson Corporation. Method and apparatus for applying wax to can lid rims. 3,852,095, Cl. 117-43.000.

Hoke Incorporated: *See—*
Teeters, Wilbur O., 3,851,853.

Holdinghausen, Paul: *See—*
Guyot, Volker; Holdinghausen, Paul; and Mueller, Martin, 3,852,673.

Holdsworth, Robert S.: *See—*
Simons, Charles W.; and Holdsworth, Robert S., 3,852,474.

Holland, Orvis L.: *See—*
Ewan, Thomas K.; Holland, Orvis L.; Martin, Willis Leon; and Hurse, James E., 3,852,408.
Martin, Willis Leon; Holland, Orvis L.; Ewan, Thomas K.; and Hurse, James E., 3,852,409.

Hollands, Daniel H., to Rochester Instrument Systems, Inc. AC voltage sensing apparatus. 3,852,731, Cl. 340-248.00b.

Holley, Myle J., Jr. Sleeved-pile structure. 3,851,483, Cl. 61-53.000.

Hollier, John Carroll Lee: *See—*
Stranahan, John Jacob; and Hollier, John Carroll Lee, 3,852,019.

Holme, Bent Melchior Karlsen, to Pedershaab Maskinfabrik A/S. Concrete pipe stabilizing ring. 3,852,018, Cl. 425-472.000.

Holmes, James Frederick: *See—*
Sohn, Fred; Hunter, Larry C.; and Holmes, James Frederick, 3,852,579.

Holoubek, George Henry; Ales, David Edward; Harms, Harland Elmer; Erickson, Warren E.; Ditmars, Maurice A.; and Brookhart, J. Keith, to Dart Industries, Inc. Foldable tubular package apparatus. 3,851,568, Cl. 93-36.800.

Holt, Fletcher O., to Combustion Engineering, Inc. Liquid heater. 3,851,625, Cl. 122-136.00r.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Shishido, Toshimasa; and Atsumi, Minoru, 3,852,379.

Honeywell Inc.: *See—*
Gregornik, Norman W.; and Swanson, Frank D., 3,852,245.
Kabat, John L., 3,852,606.
Schluter, Bernard C.; and Tromborg, Erik T., 3,851,520.

Hongu, Masayuki; and Ikeda, Isamu, to Sony Corporation. Detector circuit. 3,852,676, Cl. 329-103.000.

Hooker Chemical Corporation: *See—*
Bowman, Richard C.; Lang, Edward J.; and Grazen, Frank S., 3,852,232.
Cook, Edward H., Jr.; Emery, Alvin T.; and Schoepfle, Blaine O., 3,852,135.

Hopfner, Clemens: *See—*
Lieser, Ernst; Ort, Wolfgang; Wisst, Otto; and Hopfner, Clemens, 3,852,777.

Hopkins, Alton W., to Control Switch, Inc. Yarn detector switch-upper. 3,851,502, Cl. 66-163.000.

Hopkins, Nigel J., to Lee, Raymond, Organization, Inc., The. Mechanical chord fretter for fretted instruments. 3,851,558, Cl. 84-317.000.

Hoppesch, Joseph P.: *See—*
Borroughs, James E.; Hoppesch, Joseph P.; and Nowak, James A., 3,852,036.

Horak, Josef: *See—*
Muck, Eduard; Strachota, Jaroslav; and Horak, Josef, 3,852,230.

Hori, Makoto; Rokudo, Nerumitsu; and Ishiguro, Toshiyuki, to Matsushita Electric Industrial Co., Ltd. Burner with ultrasonic vibrator. 3,851,823, Cl. 239-102.000.

Horn, Jerry A.; and Sawer, Kermit L., to Dtaid, Inc. Point-of sale processing system. 3,852,716, Cl. 340-172.500.

Horn, Robert E.: *See—*
Bowman, Dennis W.; and Horn, Robert E., 3,852,669.

Hornung, Karl-Heinz: *See—*
Biethan, Uwe; Dorffel, Jorg; Hornung, Karl-Heinz; and Riemhofer, Franz, 3,852,375.

Horsky, Eugene G., to FMC Corporation. Packaging method. 3,851,440, Cl. 53-34.000.

Horstmann, Bevan Graham; and Vincent Frederick Reginald, to Bath Institute of Medical Engineering, The. Invalid chairs. 3,851,917, Cl. 297-345.000.

Horton, Lawrence B.: *See—*
Hsiao, Chao; and Horton, Lawrence B., 3,852,050.

Hosaka, Akio; and Wazawa, Kiyoshi, to Nissan Motor Company, Limited. Device for automatically detecting abnormal conditions in vehicle tires. 3,852,717, Cl. 340-58.000.

Hostetler, William: *See—*
Brey, Wilhelm; Hostetler, William; Loeffler, Earl Ferdnand; Kolm, Hubert Ernest; and Elder, Fred Grove, 3,852,143.

Houle, Guy Jean: *See—*
Pepkowski, Michael Paul; and Houle, Guy Jean, 3,851,885.

Houlihan, William J., to Sandoz-Wander, Inc. Process for imidazo[2,1-β] isoidoles and intermediates. 3,852,303, Cl. 260-309.600.

Houston, John M., to General Electric Company. Method of manufacturing X-ray image intensifier input phosphor screen. 3,852,131, Cl. 156-3.000.

Houston, John M., to General Electric Company. Method of manufacturing x-ray image intensifier input phosphor screen. 3,852,132, Cl. 156-3.000.

Houston, John M., to General Electric Company. Method of manufacturing x-ray image intensifier input phosphor screen. 3,852,133, Cl. 156-3.000.

Houtman, Eliberthus; and Siekman, Jakob Gerard, to U.S. Philips Corporation. Cold cathode gaseous discharge device for producing electrons in an X-ray fluorescence analysis apparatus. 3,852,596, Cl. 250-310.000.

Hovel, Harold J.: *See—*
Cuomo, Jerome J.; and Hovel, Harold J., 3,852,796.

Howe, Ralph; and Smith, Leslie Harold, to Imperial Chemical Industrial Limited. Alkanolamine derivatives as -adrenergic blocking agents. 3,852,468, Cl. 424-324.000.

Howells, Ronald McKenzie: *See—*
Jury, Harold Rex; and Howells, Ronald McKenzie, 3,851,362.

Howerton, William B.: *See—*
Schmitt, John M.; Crouse, David J., Jr.; and Howerton, William B., 3,852,407.

Howorth Air Conditioning Limited: *See—*
Howorth, Frederick Hugh, 3,852,027.

Howorth, Frederick Hugh, to Howorth Air Conditioning Limited. Fume extractors for the heaters of textile processing machines. 3,852,027, Cl. 432-59.000.

Hoynant, Georges: *See—*
Dumas, Daniel; Hoynant, Georges; and Vallon, Jean, 3,851,377.

Hozr, Ralph Anthony: *See—*
Magnino, Pete Joseph; Hozr, Ralph Anthony; and Hahn, Robert Erick, 3,852,503.

Hsiao, Chao; and Horton, Lawrence B., to FMC Corporation. Process for recovering phosphorus. 3,852,050, Cl. 55-73.000.

Huber, Jakob; and Egloff, Adolf, to Egloff, Adolf. Apparatus for influencing the speed of track-bound vehicles. 3,851,592, Cl. 104-26.00a.

Hubsch, Henry; and Schneider, Felix, to Waggon Union GmbH. Freight car side wall construction. 3,851,598, Cl. 105-409.000.

Hudman, Gary D.: *See—*
Hofman, Gerard L.; and Hudman, Gary D., 3,851,527.

Hudson, Truman O. Spray gun for producing a fan-like pattern. 3,851,820, Cl. 239-407.000.

Huebschmann, John W.; and Peperone, Joseph D., to Moore Business Forms, Inc. Hot melt, water remoistenable adhesive composition. 3,852,231, Cl. 260-28.50r.

Huffman, Clarence W., to Monsanto Company. Herbicidal Compositions and methods. 3,852,058, Cl. 71-118.000.

Hufford, Donald L., to Hufford Industries, Inc. Material handling device. 3,851,771, Cl. 214-1.0bb.

Hufford Industries, Inc.: *See—*
Hufford, Donald L., 3,851,771.

Huggins, Arthur; and Williams, Darrell Andrew, to ICI Australia Limited. Booster device. 3,851,585, Cl. 102-24.00r.

Huggins, James A., to Med-Pak Corporation. Gas humidification apparatus. 3,852,385, Cl. 261-121.00r.

Hughes, A. W., Company, Inc.: *See—*
Hughes, Alvin W., 3,851,355.

Hughes Aircraft Company: *See—*
Stark, Louis, 3,852,748.

Hughes, Alvin W., to Hughes, A. W., Company, Inc. Continuous meat forming apparatus. 3,851,355, Cl. 17-32.000.

Hull, Gerry G.; and Morris, Eugene B., Jr., to ATL Machines Corporation. Heat shrinkable coin package. 3,851,755, Cl. 206-.820.

Hulls, Leonard Robin, to RCA Corporation. Magnetic reed sensor suitable for use in ignition timing systems. 3,852,664, Cl. 324-41.000.

Hultdin, Gustaf Matteus; and Hultdin, Ove Anders, to Hultdins Verkstads AB. Method and apparatus for felling trees. 3,851,686, Cl. 144-309.0ac.

Hultdin, Ove Anders: *See—*
Hultdin, Gustaf Matteus; and Hultdin, Ove Anders, 3,851,686.

Hultdins Verkstads AB: *See—*
Hultdin, Gustaf Matteus; and Hultdin, Ove Anders, 3,851,686.

Hultman, Bengt Goran, to MoOch Domsjo Aktiebolag. Process for controlling chlorate and hydrogen ion content in the manufacture of chlorine dioxide from alkali metal chlorate and an inorganic acid. 3,852,033, Cl. 23-230.00a.

Humber, Leslie: *See—*
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Humber, Leslie G.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 3,852,285.

Humbert, Malcolm H.: *See—*
Merkle, Ralph H.; and Humbert, Malcolm H., 3,851,673.

Humphrey, John G., to General Electric Company. Circuit for color television receivers. 3,852,523, Cl. 178-5.80a.

Hunter, Gordon T., to Varian Associates. Gridded electron gun. 3,852,633, Cl. 313-411.000.

Hunter, Joe S.: *See—*
Stripling, William W.; White, Harold V.; and Hunter, Joe S., 3,851,844.

Hunter, Larry C.: *See—*
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Huntington, Robert G.: *See—*
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Hunziker, Fritz: *See—*
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Hurse, James E.: *See—*
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Martin, Willis Leon; Holland, Orvis L.; Ewan, Thomas K.; and Hurse, James E., 3,852,409.

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Hutchinson, Charles H.: *See—*
Cary, Donald S.; and Hutchinson, Charles H., 3,852,775.

Hutchinson, William M., to Philips Petroleum Company. 3,4-Bix(carbethoxy)-2-isocazoline and process. 3,852,299, Cl. 260-307.00f.

Hyde, Geoffrey: *See—*
Kreutel, Randall William, Jr.; and Hyde, Geoffrey, 3,852,763.

Hynes, Frank R., to Xerox Corporation. Compliance roll. 3,851,839, Cl. 242-147.00r.

Hynes, Roy G., to General Motors Corporation. Automotive vehicle rotary display device for indicating the occurrence of a single or a plurality of events. 3,852,712, Cl. 340-52.00f.

I-T-E Imperial Corporation: *See—*
Di Marco, Bernard; and Kralik, Andrew W., 3,852,694.

Icenbice, Phineas J., Jr. Facial stimulating apparatus having sequentially energized electrodes. 3,851,651, Cl. 128-422.000.

Ichimaru, Tadashi: *See—*
Suzuki, Hiroshi; and Ichimaru, Tadashi, 3,852,401.

Ichinose, Kazuaki: *See—*
Wakatsuki, Masao; Ichinose, Kazuaki; Mori, Riyuitiro; and Aoki, Toshio, 3,852,078.

Ichioka, Satoshi; Onishi, Kazuo; Inoue, Tadashi; Ono, Hirohisa; and Takeuchi, Shinjiro, to Mishima Kosan Co. Ltd. Magnetic facsimile and read-out device for original. 3,852,525, Cl. 178-6.610.

ICI Australia Limited: *See—*
Huggins, Arthur; and Williams, Darrell Andrew, 3,851,585.

ICN Pharmaceuticals, Inc.: *See—*
Meyer, Rich B., Jr.; Shuman, Dennis A.; and Robins, Roland K., 3,852,267.

Ihara, Eiichi, to Elepon Kogyo Kabushiki Kaisha. Pipe connecting device for submersible pump. 3,851,898, Cl. 285-24.000.

IHC Holland-Le Tourneau Marine Corporation: *See—*
Le Tourneau, Richard L.; and Hall, Chester G., 3,851,482.

Ihms, James E. Perspective pole. 3,851,394, Cl. 33-1.00k.

Iizuka, Shohei: *See—*
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Ikeda, Isamu: *See—*
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Ikegai Tekko Kabushiki Kaisha: *See—*
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Ikenque, Shinpei; and Mizuki, Eiichi, to Fuji Photo Film Co., Ltd. Process of producing positive images. 3,852,071, Cl. 96-64.000.

Imperial Chemical Industrial Limited: *See—*
Howe, Ralph; and Smith, Leslie Harold, 3,852,468.

Imperial Chemical Industries, Limited: *See—*
Waters, Graham Thomas, 3,851,457.

Inaba, Yanosuke: *See—*
Mihara, Shigetoshi; Inaba, Yanosuke; Tachibana, Koichi; Endo, Tomio; and Yasui, Eiichiro, 3,852,504.

Inagaki, Toshio: *See—*
Kurimoto, Mikishi; Ochiai, Yoshiki; Nomura, Kenji; and Inagaki, Toshio, 3,851,380.

Incremona, Joseph H.; and Strugar, Daniel, to Du Pont de Nemours, E. I., and Company. Polyamide-imide polymer having an ordered structure. 3,852,106, Cl. 117-218.000.

Industrial Nuclionics Corporation: *See—*
Rice, James S., 3,852,578.

Ingelman, Gustav-Adolf: *See—*
Bjork, Lars; Erikson, Uno Eugen; Granath, Kirsti Annikki; Ingelman, Gustav-Adolf; and Lindberg, Bernt Jabes, 3,852,341.

Ingenious Devices, Inc.: *See—*
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Inoue, Tadashi: *See—*
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Instituto Chemioterapics Italiano S.p.A.: *See—*
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Instituto Farmacologico Serono S.p.A.: *See—*
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Instytut Wlokiennictwa: *See—*
Jozwicki, Ryszard; Kubica, Henryk; Ankudowicz, Waclaw; Jedryka, Tadeusz; Roszewska, Irena; Kurzyniec, Stanislaw; Swietoslawski, Roman; and Olczyk, Franciszek, 3,851,455.

Intellectual Property Development Corporation: *See—*
Weigand, Alan Hugh, 3,852,440.
International Business Machines Corporation: *See—*
Ames, Irving, 3,852,795.
Barbeau, Raymond A.; McGinnis, Bernard W.; and Schultz, Frederick A., 3,852,820.
Braun, Roland J.; and Buckley, Frederick, 3,852,658.
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Coker, Charles Walter, Jr., 3,852,809.
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Godlewski, Robert B.; Harris, Robert D.; and Tinghitella, Michael J., 3,852,088.
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Johnson, William S.; and Ku, San-Mei, 3,852,120.
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International Harvester Company: *See—*
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Grimm, William L., 3,851,710.
International Magna Corporation: *See—*
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International Minerals & Chemical Corporation: *See—*
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International Nickel Company, Inc., The: *See—*
Turner, Trevor Stanley; and Whittle, John Edward, 3,852,112.
International Standard Electric Corporation: *See—*
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International Telephone and Telegraph Corporation: *See—*
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International Video Corporation: *See—*
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IPOS Gesellschaft fur integrierte Prothesen Entwicklung und orthopadietechnischen Service m.b.H. & Co., KG: *See—*
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Ipran-Institutul de Proiectari Pentru Industria Chimica Anorgonica si a Ingrasamintelor: *See—*
Dumitru, Ion D.; Grigoras, Victor A.; Turtureanu, Mircea Ioan T.; Stancio, Doina Ecaterina G.; and Anescu, Vasile V., 3,851,406.
Irie, Nobuhiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Mould assembly of tire vulcanizer. 3,852,006, Cl. 425-47.000.
Isaasa, Takashi: *See—*
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Ishiguro, Toshiyuki: *See—*
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Ishii, Hiroshi, to Nichicon Capacitor Limited. Explosion proof structure for electrolytic capacitor. 3,852,647, Cl. 317-230.000.
Ishii, Toshio; Takamatsu, Tasuto; Yurugi, Shojiro; and Masuda, Katsutada, to Takeda Chemical Industries, Ltd. Treatment and prevention of coccidiosis in poultry. 3,852,449, Cl. 424-251.000.
Ishikawa, Narimasa; Suzuki, Susumu; Ougusa, Yasuhiro; and Arai, Koozo, to Japan Synthetic Rubber Co., Ltd. Polymer composition having high flow property. 3,852,225, Cl. 260-5.000.
Isomet Corporation: *See—*
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Ital Elettionica S.p.A.: *See—*
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Ito, Kenjiro: *See—*
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Ito, Takashi: *See—*
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Itoh, Takusen; Onose, Kenji; Ueda, Takayoshi; Okigami, Noboru; and Miyabayashi, Iwao, to Hitachi Shipbuilding & Engineering Co., Ltd. Apparatus disposing waste gas by burning. 3,852,023, Cl. 431-202.000.
Itoh, Yokichi; Sunami, Hideo; and Kamigaki, Yoshiaki, to Hitachi, Ltd. Charge-coupled semiconductor device provided with biasing charges. 3,852,801, Cl. 357-24.000.
ITT Industries, Inc.: *See—*
Wienecke, Franz Josef, 3,852,613.
ITW-ATECO G.m.b.H.: *See—*
Hehl, Klaus Friedrich, 3,851,794.
Iura, Yukio, to Canon Kabushiki Kaisha. Single lens reflex camera of TTL photometry type. 3,852,778, Cl. 354-51.000.
Ivanov, Borislav S.; and Ivanova, Raina V. Platen for multiplex typewriter or similar devices. 3,851,746, Cl. 197-144.000.
Ivanov, Vadim Georgievich: *See—*
Brodov, Valery Fedorovich; Osipov, Vyacheslav Stepanovich; Zhdanov, Mikhail Dmitrievich; Burov, Anatolievich; Kovalev, Fedor Lukich; But, Anatoly Illarionovich; Ivanov, Vadim Georgievich; Belyaev, Nikolai Nikolaevich; and Bashev, Lev Alexandrovich, 3,852,01.
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Jackson, Jack M. Clay free aqueous drilling fluid. 3,852,201, Cl. 252-8.50a.
Jackson, Norman Walter, to Molins Limited. Reel Mountings. 3,851,833, Cl. 242-68.300.
Jacobs, James W., to General Motors Corporation. Protable dispenser apparatus for producing a carbonated beverage. 3,851,797, Cl. 222-129.400.
Jacobs, Joseph L.: *See—*
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Jacobs, Orville W., to East Dayton Tool & Die Company, The. Method of pulley manufacture. 3,851,366, Cl. 29-159.00r.
Jacobs, Stanley C.; Jarrett, Noel; and Graham, Robert W., to Aluminum Company of America. Alumina reduction process. 3,852,173, Cl. 204-67.000.
Jacobson, Peter E., to Sperry Rand Corporation. Hydrodynamic fluid-film bearings. 3,851,933, Cl. 308-9.000.
Jacobus, David P.; Leanza, William J.; and Christensen, Burton G., to Merck & Co., Inc. 3-[(α-Methoxy-4-substituted cinnamoyl) oxymethyl]-7-acylamidoceph-3-em-4-carboxylic acids. 3,852,277, Cl. 260-240.00j.
Jaffe, Israeli A., to Merck & Co., Inc. Treatment of rheumatoid arthritis. 3,852,454, Cl. 424-263.000.
Jakubek, Peter; and Biswanger, Karl, to Research Filter- und Patentforschungs-Ges. m.b.H., Firma. Liquid-purifying process and apparatus. 3,852,193, Cl. 210-73.000.
Jalbert, Domina C. Spinnaker construction. 3,851,612, Cl. 114-103.000.
Janirek, Vladislav: *See—*
Miculka, Zdenek; Janirek, Vladislav; Rektorik, Vladimir; and Hanacek, Josef, 3,851,414.
Janosko, Michael J. Non-marring horizontal clamp. 3,851,358, Cl. 24-248.00c.
Janssen, Paul Adriaan, to Janssen Pharmaceuticals, N.V. Antidepressive activity of tetramisole. 3,852,458, Cl. 424-270.000.
Janssen Pharmaceuticals, N.V.: *See—*
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Jasinski, Leon, to Motorola, Inc. Rapid battery charging system and method. 3,852,652, Cl. 320-35.000.
Jeanmaire, David: *See—*
Glaus, Heinrich; and Jeanmaire, David, 3,851,683.
Jeannet, Jean-Pierre; and Leuba, Jean-Pierre, to Tesa S.A. Micrometer with digital reading. 3,851,397, Cl. 33-166.000.
Jedryka, Tadeusz: *See—*
Jozwicki, Ryszard; Kubica, Henryk; Ankudowicz, Waclaw; Jedryka, Tadeusz; Roszewska, Irena; Kurzyniec, Stanislaw; Swietoslawski, Roman; and Olczyk, Franciszek, 3,851,455.
Jefferson Chemical Company, Inc.: *See—*
Bentley, Floyd Edward, 3,852,221.
Jenkins, Cecil; and Woolslayer, Joseph R., to Moore, Lee C. Pivoted well drilling mast and separate tower. 3,851,770, Cl. 214-2.500.
Jenkins, William A., to Monarch Marking Systems, Inc. Method of dispensing labels. 3,852,139, Cl. 156-250.000.
Jenkins, William A., to Monarch Marking Systems, Inc. Method of making composite web of labels. 3,852,140, Cl. 156-253.000.
Jersey Nuclear Company, mesne: *See—*
Carlson, Roy C.; King, Loyd L.; and Sofer, George A., 3,852,154.
Jespersen, Paul W., to Georgia-Pacific Corporation. Contoured feed spring. 3,851,810, Cl. 226-121.000.
Jessop, Thomas C., to Eastman Kodak Company. Photographic processing solution filling and circulating apparatus. 3,851,662, Cl. 137-563.000.

Jet, Marion Barney; and Spriggs, Dennis Mitchel, to Dresser Industries, Inc. Dual hydraulically actuated oil well packer. 3,851,705, Cl. 166-120.000.

Jetsew, Inc.: *See*—
Rockerath, John L., 3,851,605.

Jett, Marion Barney, to Dresser Industries, Inc. Uni-directional unitary anchor slip. 3,851,707, Cl. 166-212.000.

Jirkovsky, Ivo: *See*—
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 3,852,285.

Jobe, Benjamin L.: *See*—
Cannon, Glyn E.; Kruger, James R.; Short, Theodore A.; and Jobe, Benjamin L., 3,851,492.

Johanns, Johannes Hendricus Maria; and Hasker, Jan, to U.S. Philips Corporation. Cathode-ray tube having an astigmatic lens element in its electron gun. 3,852,608, Cl. 313-449.000.

Johansson, Folke, to Granges Engineering Aktiebolag. Method of heating goods and a heating furnace. 3,852,026, Cl. 432-23.000.

John Dieter: *See*—
Baum, Hans; Reinicke, Ralf; and John Dieter, 3,851,581.
Baum, Hans; Reinicke, Ralf; and John, Dieter, 3,852,564.

Johnson, A., & Co., Inc.: *See*—
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Johnson, Delmar R.; and Elkus, Rickard J., Jr., to Ampex Corporation. Magnetic tape recording and/or reproducing apparatus having means to relocate a previous termination of recording or reproducing. 3,852,814, Cl. 360-72.000.

Johnson, Marvin M.: *See*—
De Vault, Albert M.; and Johnson, Marvin M., 3,852,252.

Johnson Service Company: *See*—
Chacon, Manuel Frank, 3,852,727.

Johnson, William S.; and Ku, San-Mei, to International Business Machines Corporation. Method for manufacturing ion implanted insulated gate field effect semiconductor transistor devices. 3,852,120, Cl. 148-1.500.

Jones, Derrick A.; and Golden, Michael G., to Minnesota Mining & Manufacturing Company. Coded legend marking assembly having transmit and receive printing circuitry. 3,852,770, Cl. 346-74.0es.

Jones, John L.: *See*—
Brooks, Herbert; Gearheart, John D.; and Jones, John L., 3,851,960.

Jones, Marcellus. Pencil sharpener. 3,851,687, Cl. 145-3.100.

Jones, R. A., & Company, Incorporated: *See*—
Jones, Wickliffe, 3,851,751.

Jones, Ralph Godfrey, to Preci-Spark Limited. Stacked trays. 3,851,754, Cl. 206-549.000.

Jones, Thomas Alan, to Combustion Engineering, Inc. Eccentric coupling means. 3,851,987, Cl. 403-374.000.

Jones, Wickliffe, to Jones, R. A., & Company, Incorporated. Method and apparatus for forming, filling and sealing packages. 3,851,751, Cl. 198-179.000.

Jorgensen, George N.; and Wartner, Frank J., to Square D Company. Waterproof bus duct housing. 3,852,515, Cl. 174-68.00c.

Jorgensen, Stanley A., to Caterpillar Tractor Company. Lubrication system for gear drive mechanisms. 3,851,731, Cl. 184-6.200.

Jozwicki, Ryszard; Kubica, Henryk; Ankudowicz, Waclaw; Jedryka, Tadeusz; Roszewska, Irena; Kurzyniec, Stanislaw; Swietoslawski, Roman; and Olczyk, Franciszek, to Instytut Wlokiennictwa. Method for manufacturing yarn from natural and chemical fibers and a dvice for carrying out the method. 3,851,455, Cl. 57-58.950.

Juncosa Lopez, Jose. Rail joint. 3,851,821, Cl. 238-230.000.

Jury, Harold Rex; and Howells, Ronald McKenzie, to Comalco (J. & S.) Pty. Limited. Expanded mesh. 3,851,362, Cl. 29-6.100.

Just, Franklin H.; and Powell, Brent L., to Waters, John A. Solid state ignition circuitry. 3,851,636, Cl. 123-148.00e.

Justice, Gregory, to Hewlett-Packard Company. High efficiency power supply. 3,852,655, Cl. 321-9.000.

Justrite Manufacturing Company: *See*—
Flider, Frank S., 3,851,791.

Kabat, John L., to Honeywell, Inc. Flame detection system utilizing a radiation coupling. 3,852,606, Cl. 250-551.000.

Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
Artbauer, Jan, 3,852,511.

Kablaoui, Mahmoud S.; Godfrey, Arthur W.; and Reid, Robert E., to Texaco Inc. Transmission fluid compositions and method. 3,852,205, Cl. 252-47.500.

Kabushiki Kaisha Daini Seikosha: *See*—
Noguchi, Kazuo; Iwai, Shigeru; Sato, Yukihiro; and Kitamura, Yoshiaki, 3,851,769.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kitai, Kenzaburo; and Tomita, Mizuho, 3,851,988.

Kabushiki Kaisha Plastic Kogaku Kenkyusho: *See*—
Murakami, Kenkichi, 3,852,198.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Suzuki, Masaru (said Suzuki assor. to), 3,852,543.

Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.): *See*—
Masuzawa, Isao; Awano, Tsuneo; and Onishi, Kazutoshi, 3,852,650.

Kaelin, Bette M., to Glass, Marvin, & Associates. Reversible doll. 3,851,419, Cl. 46-153.000.

Kaempen, Charles E., to Kaempen Industries, Inc. Composite structure. 3,851,786, Cl. 220-3.000.

Kaempen Industries, Inc.: *See*—
Kaempen, Charles E., 3,851,786.

Kager, Alfred. Solder feeding soldering gun with temperature control. 3,852,565, Cl. 219-241.000.

Kahan, Frederick M.; and Cassidy, Patrick J., to Merck & Co., Inc. Potentiation of (-) cis-1,2-epoxypropyl) phosphonic acid and analogues thereof. 3,852,434, Cl. 424-180.000.

Kahr, Kurt: *See*—
Weitz, Hans Martin; Vogel, Hans-Henning; Kahr, Kurt; and Fuchs, Hugo, 3,852,356.

Kaiser, Ado; Koch, Wolfgang; Scheer, Marcel; and Wolcke, Uwe, to Hoffmann-La Roche Inc. N-substituted phenylalanine derivatives. 3,852,338, Cl. 260-501.120.

Kaiser, Robert G. Antenna construction. 3,852,757, Cl. 343-713.000.

Kajfez, Franjo; Kovac, Tomislav; and Sunjic, Vitomir, to CRC Compagnie di Ricerca Chimica S.A. Derivatives of 1,4-benzodiazepin-2-one and methods for preparation thereof. 3,852,274, Cl. 260-239.30d.

Kalitta, Carl L., to Dura Corporation. Vehicle bumper construction and method of making same. 3,851,909, Cl. 293-70.000.

Kam-Act Enterprises, Inc.: *See*—
Alexander, Alex E., 3,851,638.

Kamigaki, Yoshiaki: *See*—
Itoh, Yokichi; Sunami, Hideo; and Kamigaki, Yoshiaki, 3,852,801.

Kampf, Richard S., to Beckman Instruments, Inc. Dual channel strip chart recorder with visible styli. 3,852,769, Cl. 346-49.000.

Kanai, Hiromi: *See*—
Yamazaki, Eiichi; and Kanai, Hiromi, 3,852,637.

Kane, Richard E.; and Fischer, William H., to Westinghouse Electric Corporation. Combination hand-jack, semaphore and travel indicator for high-voltage circuit interrupter. 3,852,556, Cl. 200-310.000.

Kaneko, Yasuhisa: *See*—
Niimi, Itaru; Kaneko, Yasuhisa; Noguchi, Masamitu; Uchida, Tsuneo; and Katori, Youhei, 3,852,063.

Karagianes, Manuel T.: *See*—
Wheeler, Kenneth R.; Sump, Kenneth R.; and Karagianes, Manuel T., 3,852,045.

Karla, Heinz: *See*—
Kuife, Siegfried; Karla, Heinz; and Frings, Gerd, 3,851,368.

Karp, John I. Apparatus for mixing clay. 3,851,859, Cl. 259-6.000.

Kasper, Michael E. Litter and trash receptacles. 3,851,790, Cl. 220-85.00r.

Kaspers, Helmut: *See*—
Grohe, Klaus; Kaspers, Helmut; and Scheinpflug, Hans, 3,852,470.

Kassel, Walter Dopper; Hausler, Dietrich; and Kohler, Walter, to Rheinstahl Aktiengesellschaft. Device for crushing solid materials. 3,851,829, Cl. 241-188.00r.

Kato, Eizo: *See*—
Watanabe, Eiji; Kato, Eizo; Shimomura, Takayuki; Ito, Takashi; Nakamura, Koichiro; and Fujii, Tadashi, 3,852,605.

Kato, Naoomi; and Tao, Morio, to Nippon Kogaku K.K. Ophthalmoscopic camera. 3,851,954, Cl. 351-7.000.

Katoh, Hiroshi, to Victor Company of Japan. Automatic tape loading type recording and/or reproducing apparatus having a pinch roller actuating device. 3,851,816, Cl. 226-91.000.

Katori, Youhei: *See*—
Niimi, Itaru; Kaneko, Yasuhisa; Noguchi, Masamitu; Uchida, Tsuneo; and Katori, Youhei, 3,852,063.

Katsuragawa Denki Kabushiki Kaisha: *See*—
Furuichi, Masayoshi; Akiba, Nobuo; and Kudo, Seiichi, 3,851,965.

Katsuragawa, Seiichi; and Koketsu, Norihisa, to Central Glass Co., Ltd. Stabilized trichloroethylene or tetrachloroethylene. 3,852,367, Cl. 260-652.50r.

Katto, Takayuki: *See*—
Murayama, Naohiro; and Katto, Takayuki, 3,852,429.

Katz, Bernard R. Proximity measuring employing a self-balancing bridge and measuring the adjustable balancing component thereof. 3,852,662, Cl. 324-34.0ps.

Katz, Morris H.; and Brandberg, Lawrence C., to Pillsbury Company, The. Heat and moisture activated savory coating system for popcorn. 3,851,574, Cl. 426-107.000.

Kaufman, Harold C.: *See*—
Schlinger, Warren G.; Kaufman, Harold C.; and Crawley, Carroll L., 3,852,047.

Kaufmann, John, Jr. Anti-pollution exhaust conversion systems. 3,851,470, Cl. 60-298.000.

Kausche, Helmold: *See*—
Cirkler, Werner; Schauer, Alois; and Kausche, Helmold, 3,852,181.

Kawaragi, Hiroshi. Apparatus for re-sharpening the cutting edges of a drill. 3,851,424, Cl. 51-133.000.

Kay, Edward L.: *See*—
Lohr, Delmar F., Jr.; and Kay, Edward L., 3,852,229.

Keating, Richard T.; and Keating, Richard T., Jr. Deep fat fryer with controllable heat-up for cold fat melt. 3,851,640, Cl. 126-391.000.

Keating, Richard T., Jr.: *See*—
Keating, Richard T.; and Keating, Richard T., Jr., 3,851,640.

Keely, James L.: *See*—
Andres, William A.; Quanrud, Larry D.; Koppa, Charles J.; Becker, Larry F.; Christoffersen, William K.; and Keely, James L., 3,851,950.

Keith, Charles H.: *See*—
Levers, William E.; and Keith, Charles H., 3,852,007.
Roberts, John D.; Ellenberg, John D.; and Keith, Charles H., 3,852,009.

Kelco Company: *See—*
Hartnek, Henry G.; Empey, Richard A.; Pettitt, David J.; and Van Winkle, Terry L., 3,852,257.

Kell, Howard A., Jr.; Yeager, Eugene W.; and Manteghian, Allen A., to Philico-Ford Corporation. Motorized radio search tuner. 3,852,691, Cl. 334-19.000.

Kellner, Raymond M.; and Gee, Minor E. Process for fabricating walls. 3,851,384, Cl. 29-430.000.

Kelso Marine, Inc.: *See—*
Linam, Richard L., 3,852,562.

Kemp, Jacob D., to Chevron Research Company. Isoparaffin-olefin alkylation with a supported HF antimony pentafluoride catalyst. 3,852,371, Cl. 260-683.470.

Kendall Company, mesne: *See—*
Darling, Phillip H., 3,851,650.

Kendall Company, The: *See—*
Villari, Frank K., 3,851,649.

Kendall, Roger Vernon, to American Cyanamid Company. Process for the synthesis of bis-N-phosphorylated compounds. 3,852,397, Cl. 260-968.000.

Kennedy, C. Bruce; and Pasieka, John F., to Polaroid Corporation. Photographic apparatus for successively presenting a sequence of film units to an exposure station and then processing the film units. 3,852,783, Cl. 354-174.000.

Kenny, Philip C.: *See—*
. Bliss, Arthur E.; and Kenny, Philip C., 3,852,521.

Kent, Arthur P.; and Marks, Mortimer, to Marks Polarized Corporation. Apparatus for converting motion picture projectors for stereo display. 3,851,955, Cl. 351-60.000.

Kepple, Richard K.; and Smith, Claude A., to General Motors Corporation. Transmission. 3,851,546, Cl. 74-785.000.

Keuffel & Esser Company: *See—*
Levinos, Steven, 3,852,070.

Keusch, Andreas. Plastic container for footbath. 3,851,340, Cl. 4-182.000.

Key Oilfield Supply & Rentals Ltd.: *See—*
Thompson, James Gordon, 3,852,197.

Keystone Industries, Inc.: *See—*
Hawthorne, Vaughn T., 3,851,768.

Khegai, Anatoly Sergeevich: *See—*
Maslenok, Boris Arkadievich; Khegai, Anatoly Sergeevich; Zlobin, Viktor Grigorievich; Mednitsky, Viktor Georgievich; Genkin, Lev Isaakovich; Petrichenko, Nikolai Fedorovich; and Mitrofanov, Boris Ivanovich, 3,852,153.

Khuntia, Natabara: *See—*
Story, Thomas A.; and Khuntia, Natabara, 3,851,932.

Kickhaefer Aeromarine Motors, Inc.: *See—*
Kiekhaefer, Elmer Carl, 3,851,631.

Kiekhaefer, Elmer Carl, to Kickhaefer Aeromarine Motors, Inc. Die cast V-type two-cycle engine. 3,851,631, Cl. 123-55.00r.

Kikkoman Shoyu Co., Ltd.: *See—*
Yokotsuka, Tamotsu; Isaasa, Takashi; and Fujii, Mitsuharu, 3,852,479.

Kimball, Jerome Watis; and Kimball, Kenny Harrell, to PermaCraft Corporation. Plastic molding machine. 3,852,014, Cl. 425-388.000.

Kimball, Kenny Harrell: *See—*
Kimball, Jerome Watis; and Kimball, Kenny Harrell, 3,852,014.

Kimberly, Bobby G., to Bomar Manufacturing Company, Inc. Tubeless tire bead seating machine. 3,851,695, Cl. 157-1.100.

Kimijima, Hiroatsu; Iizuka, Shohei; and Fujii, Hironao, to Fujisoku Electric Co., Ltd. Toggle switch. 3,852,552, Cl. 200-153.00g.

Kimmel, Albert L.; Argabright, Perry A.; and Presley, C. Travis, to Marathon Oil Company. Isocyanurate-based polyelectrolyte detergent compositions. 3,852,220, Cl. 252-524.000.

Kimura, Seiichi; Suzuki, Talao; and Nakajima, Masahiro, to Taiyo Yuden Kabushiki Kaisha. Tube socket having a plurality of electrical discharge gaps. 3,852,699, Cl. 339-14.00t.

Kimura, Shiro G., to General Electric Company. Preparation of asymmetric polymer membranes. 3,852,388, Cl. 264-41.000.

Kimura, Toshio: *See—*
Tanaka, Shoichi; Kousaka, Susumu; and Kimura, Toshio, 3,852,402.

Kindgren, Lee; and Scott, William B., to Whitney, W. A., Corporation. Material handling apparatus with carriage drive means. 3,852,649, Cl. 318-257.000.

King, Charles M.: *See—*
Druliner, Joe D.; and King, Charles M., 3,852,327.

King, Charles M., to Du Pont de Nemours, E. I., and Company. Selective isomerization of pentenenitriles. 3,852,325, Cl. 260-465.900.

King, Loyd L.: *See—*
Carlson, Roy C.; King, Loyd L.; and Sofer, George A., 3,852,154.

Kingsford Company, The: *See—*
Pyle, Owen, 3,852,048.

Kinslow, William G., Jr. Infant seat rocker. 3,851,343, Cl. 5-109.000.

Kirton, Kenneth T.; and Southern, Edward M., to Upjohn Company, The. Abortion by myometrial administration of prostaglandins. 3,852,465, Cl. 424-305.000.

Kitai, Kenzaburo; and Tomita, Mizuho, to Kabushiki Kaisha Komatsu Seisakusho. Self-propelling soil-compactor. 3,851,988, Cl. 404-129.000.

Kitamura, Yoshiaki: *See—*
Noguchi, Kazuo; Iwai, Shigeru; Sato, Yukihiro; and Kitamura, Yoshiaki, 3,851,769.

Kitano, Yoshizo. Portable screw cutting machine. 3,851,564, Cl. 90-11.520.

Kitasato Institute Tokyo, Japan, The: *See—*
Nakase, Yasukiyo; and Kojima, Yasuhiko, 3,852,423.

Kiyanagi, Tetsuo; Suzuki, Morio; and Yoshino, Hiroshi, to Yamasa Shoyu Kabushiki Kaisha. Process for producing 5-iodo-deoxyuridine. 3,852,266, Cl. 260-211.50r.

Klabunde, Steven Eldor, to Giddings & Lewis, Inc. Measuring gage for turning machines and the like. 3,851,396, Cl. 33-143.00l.

Klapproth, William J., Jr.: *See—*
Ryder, Robert C.; Ryan, Robert E.; and Klapproth, William J., Jr., 3,852,308.

Klebba, Horst, to Volkswagenwerk AG. Latching mechanism for sliding doors in a motor vehicle. 3,851,905, Cl. 292-11.000.

Klein, Andrew R.; a member of the firm of Synnestvedt & Lechner: *See—*
Brooks, Ralph J., 3,851,911.

Klein, Harold T. Cantilever stairstep construction. 3,851,431, Cl. 52-189.000.

Klein, Heinrich: *See—*
Fracke, Aribert; Klein, Heinrich; Pieper, Rudolf; Weber, Eduard; and Wachtler, Hans, 3,851,404.

Klein, Perry Ian, to Communications Satellite Corporation. Navigation satellite system. 3,852,750, Cl. 343-105.00r.

Kleitman, David: *See—*
Wolf, Helmut F.; and Kleitman, David, 3,852,802.

Klestern Litho Plate & Supply Co.: *See—*
Parker, Edward H.; Harris, Edward M.; and Meador, Jim D., 3,852,256.

Klippan GmbH: *See—*
Minolla, Horst, 3,851,360.

Kloweit, Kenneth R. Sign with inlaid letters. 3,852,145, Cl. 161-18.000.

Kluge, Reinhard: *See—*
Kluge, Willi; and Kluge, Reinhard, 3,851,773.

Kluge, Willi; and Kluge, Reinhard. Stacking device, particularly for newspapers. 3,851,773, Cl. 214-6.500.

Kluksdahl, Harris E.: *See—*
Buss, Waldeen C.; and Kluksdahl, Harris E., 3,852,190.

Knapp, Erich, to Ciba-Geigy AG, mesne. Polyester-metal laminates. 3,852,151, Cl. 161-162.000.

Knapp, Furn F., Jr.: *See—*
Nicholas, Harold J.; and Knapp, Furn F., Jr., 3,852,311.

Knorr-Bremes GmbH: *See—*
Gebhardt, Hans; Prahl, Franz; and Schorwerth, Mathias, 3,851,738.

Knoth, Harold Monroe, to Deere & Company. Tractor cab with combined tilt pivot and resilient mounts. 3,851,913, Cl. 296-35.00r.

Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans Georg. Process and a device for even distribution and alternating supply of liquid and gaseous protective media for the refining gas tuyeres of a converter. 3,851,866, Cl. 266-41.000.

Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans George, to Eisenwerk Gesellschaft. Process and a device for even distribution and alternating supply of liquid and gaseous protective media for the refining gas tuyeres of a converter. 3,852,062, Cl. 7-60.000.

Knutsen, Tryggve Lund; and Osterman, Sven-Olof, to Astra Nutrition Aktiebolag. Process for preparing fish protein using propanol or butanol. 3,852,260, Cl. 260-112.00r.

Kobel, Erwin H.: *See—*
Watson, William David; and Kobel, Erwin H., 3,852,160.
Yoshimine, Masao; and Kobel, Erwin H., 3,852,161.

Kober, Frederick P., to Chem-E-Watt Corporation,mesne. Self contained electrochemical heat source. 3,851,654, Cl. 132-33.000.

Koch, Jurgen, to National Rejectors Inc., GmbH. Apparatus for testing the authenticity of paper currency. 3,851,971, Cl. 356-71.000.

Koch, Wolfgang: *See—*
Kaiser, Ado; Koch, Wolfgang; Scheer, Marcel; and Wolcke, Uwe, 3,852,338.

Kodo, Chikashi: *See—*
Furukawa, Kenji; Uyama, Hirofuji; Tsuchiya, Takashi; Kodo, Chikashi; and Torii, Keiichi, 3,851,405.

Koehler, Carlton L. Combination head and case mounted light. 3,852,587, Cl. 240-60.000.

Kohl, Carl O., to Mercury Aircraft, Inc. Shelf corner clamp. 3,851,600, Cl. 108-144.000.

Kohler, Karl, to International Standard Electric Corporation. Radiolocation system. 3,852,749, Cl. 343-102.000.

Kohler, Walter: *See—*
Kassel, Walter Dopper; Hausler, Dietrich; and Kohler, Walter, 3,851,829.

Kohls, Richard S. Foldable ski cover. 3,851,689, Cl. 150-52.00r.

Kohn, Gustave K., to Chevron Research Company. Organic pesticide residue removal from aqueous solutions. 3,852,490, Cl. 426-271.000.

Kojima, Yasuhiko: *See—*
Nakase, Yasukiyo; and Kojima, Yasuhiko, 3,852,423.

Koketsu, Norihisa: *See—*
Katsuragawa, Seiichi; and Koketsu, Norihisa, 3,852,367.

Kokkinis, Nikolaus, to Lindauer Dornier Gesellschaft mbH. Weft thread inserting device for shuttleless looms. 3,851,676, Cl. 139-122.000.

Kolb, Bruno; and Bischoff, Joachim, to Bodenseewerk Perkin-Elmer & Co. GmbH. Selective ionization detector. 3,852,037, Cl. 23-254.0ef.

Kolbe, Joachim. Vehicle banking arm construction. 3,851,893, Cl. 280-112.00a.

Kolesikova, Nina Ivanovna: *See—*

Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Kolesikova, Nina Ivnovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,852,431.

Kolm, Hubert Ernest: *See—*
Brey, Wilhelm; Hostetler, William; Loeffler, Earl Ferdnand; Kolm, Hubert Ernest; and Elder, Fred Grove, 3,852,143.

Komine, Yoshio, to Canon Kabushiki Kaisha. Photographic overlapping apparatus having safety devices for motion picture cameras. 3,851,956, Cl. 352-91.00c.

Komiske, Frank Charles, to Sybron Corporation. Toeboard. 3,851,858, Cl. 256-59.000.

Komor, Joseph A., to GAF Corporation. Surfactant for electrolyte-containing processing solutions. 3,852,030, Cl. 8-111.000.

Konen, Josef: *See—*
Saueressig, Johann Heinrich; Konen, Josef; and Metges, Paul, 3,851,582.

Koninklijke Nederlandsche Gis-en Spritus-Fabriek N.V.: *See—*
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Kononenko, Vadim Grigorievich: *See—*
Fedosenko, Igor Grigorievich; Kononenko, Vadim Grigorievich; Lepetjukha, Vladimir Semenovich; and Vasilchenko, Lev Petrovich, 3,851,713.

Kononov, Ivan Vasilievich: *See—*
Goryainov, Vladimir Ivanovich; Kononov, Ivan Vasilievich; Maslennikov, Ivan Egorovich; Platonov, Vladimir Nikiforovich; and Popov, Vyacheslav Evgenievich, 3,851,667.

Konstantinov, Vladimir Ivanovich: *See—*
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Kolesikova, Nina Ivnovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,852,431.

Kooi, Else; DeWerdt, Reinier; and Nijdam-Paffen, Maria Magdalena Mathilda, to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 3,852,104, Cl. 117-212.000.

Kooistra, John A., Jr., to Procter & Gamble Company, The. Synergistic mixtures of diphenylbismuth acetate and the zinc salt of 1-hydroxy-2-pyridine thione effect as antibacterial and antifungal agents. 3,852,441, Cl. 424-245.000.

Koorneef, Jacob, to U.S. Philips Corporation. Method of bonding together mouldings of sintered oxidic ferromagnetic material. 3,851,375, Cl. 29-471.900.

Koppa, Charles J.: *See—*
Andres, William A.; Quanrud, Larry D.; Koppa, Charles J.; Becker, Larry F.; Christoffersen, William K.; and Keely, James L., 3,851,950.

Koppers Company, Inc.: *See—*
McClelland, Ronald O., 3,852,159.
Ryder, Robert C.; Ryan, Robert E.; and Klapproth, William J., Jr., 3,852,308.

Korwitz, Norman H.: *See—*
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Kousaka, Susumu: *See—*
Tanaka, Shoichi; Kousaka, Susumu; and Kimura, Toshio, 3,852,402.

Kovac, Tomislav: *See—*
Kajfez, Franjo; Kovac, Tomislav; and Sunjic, Vitomir, 3,852,274.

Kovalev, Fedor Lukich: *See—*
Brodov, Valery Fedorovich; Osipov, Vyacheslav Stepanovich; Zhdanov, Mikhail Dmitrievich; Burov, Anatolievich; Kovalev, Fedor Lukich; But, Anatoly Illarionovich; Ivanov, Vadim Georgievich; Belyaev, Nikolai Nikolaevich; and Bashev, Lev Alexandrovich, 3,852,01.

Kowalcheck, Harry: *See—*
Lide, Basil M.; and Kowalcheck, Harry, 3,852,621.

Koyama, Mitsuo: *See—*
Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, 3,852,786.

Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, to Shinetsu Chemical Company. Excipient and shaped medicaments prepared therewith. 3,852,421, Cl. 424-94.000.

Kraft, Winfried; Wasmund, Heiko; and Haas, Karl-Heinz, to Leitz, Ernst, GmbH. Microscope having a photometer. 3,851,949, Cl. 350-18.000.

Kralik, Andrew W.: *See—*
Di Marco, Bernard; and Kralik, Andrew W., 3,852,694.

Kramer, Norman: *See—*
Breslow, Jeffrey D.; and Kramer, Norman, 3,851,875.

Krapcho, John; and Turk, Chester Frank, to Squibb, E. R., & Sons, Inc. 7-Substituted-3,3a,4,5,6,7-hexahydro-3-substituted-2H-pyrazolo(4,3-c)pyridines. 3,852,279, Cl. 260-240.00f.

Krapcho, John, to Squibb, E. R., & Sons, Inc. Aminoalkoxyphenylurea derivatives. 3,852,339, Cl. 260-501.120.

Krapcho, John, to Squibb, E. R., & Sons, Inc. Substituted cycloalkyl ureas. 3,852,347, Cl. 260-553.00a.

Krauss, Hans Ludwig; and Stach, Hans, to Messer. Griesheim GmbH. Method of removing oxygen from gases. 3,852,406, Cl. 423-219.000.

Krauss-Maffei Aktiengesellschaft: *See—*
Schwarzler, Peter; and Walkner, Christian, 3,851,594.

Kravitz, Stanley: *See—*
Suggitt, Robert M.; Estes, John H.; and Kravitz, Stanley, 3,852,372.

Krawczak, Gale F.: *See—*
Carp, Ralph W.; Weissler, Harold E., II; and Krawczak, Gale F., 3,852,616.

Kreutel, Randall William, Jr.; and Hyde, Geoffrey, to Communications Satellite Corporation. Torus-type antenna having a conical scan capability. 3,852,763, Cl. 343-761.000.

Kreutze, Gerhard; Moessner, Manfred; Obstfelder, Guenther; Soehring, Gerhard; and Pfirrman, Victor. Method and device for controlling a motion picture projector, especially a projector for teaching machines. 3,851,959, Cl. 352-177.000.

Kreuzer, Karl-Heinz, to Licentia, Patent-Verwaltungs-G.m.b.H. Method of diffusing impurities into semiconductor wafers. 3,852,128, Cl. 148-189.000.

Krezanoski, Joseph Z., to Flow Pharmaceuticals, Inc. Stable liquid detergent concentrates containing active oxygen. 3,852,210, Cl. 252-95.000.

Kring, Elbert Victor; and Wolfe, William Ray, Jr., to Du Pont de Nemours, E. I., and Company. Measurement of carbon monoxide in gas mixtures. 3,852,169, Cl. 204-1.00t.

Krivoshlykov, Jury Mikhailovich: *See—*
Zlotin, Anatoly Vladimirovich; Krivoshlykov, Jury Mikhailovich; and Tikhonovsky, Alexei Lavrentievich, 3,851,775.

Krom, Lynn C., to General Motors Corporation. Adjustable steering column. 3,851,543, Cl. 74-493.000.

Krueckels, Walter; and Ruescher, Markus, to Maschinenfabrik Zell J. Krueckels KG. Winding apparatus for a web. 3,851,832, Cl. 242-66.000.

Kruger, James R.: *See—*
Cannon, Glyn E.; Kruger, James R.; Short, Theodore A.; and Jobe, Benjamin L., 3,851,492.

Krutchen, Charles M., to General Electric Company. Melt extrudable polyacetylene copolymer blends. 3,852,235, Cl. 260-32.400.

Krylova, Irina Fedorovna: *See—*
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Kubo, Masaharu, to Hitachi, Ltd. Semiconductor circuit. 3,852,625, Cl. 307-304.000.

Kubota, Hiroaki; Nakamura, Yoshithugu; and Hasegawa, Ryoichi, to Teijin Limited. Thermoplastic polycarbonate [polybutadiene-methacrylate-styrene graft polymer] styrene-acrylonitrile copolymer blends. 3,852,394, Cl. 260-873.000.

Kudamatsu, Akio; Miyamoto, Masao; and Fukazawa, Nobuo, to Bayer Aktiengesellschaft. Substituted benzyl-thiocarbamic acid esters. 3,852,318, Cl. 260-455.00a.

Kudo, Seiichi: *See—*
Furuichi, Masayoshi; Akiba, Nobuo; and Kudo, Seiichi, 3,851,965.

Kufner, Walter, to SKF Industrial Trading and Development Company B.V. Journal for rolls. 3,851,934, Cl. 308-15.000.

Kuhle, Engelbert: *See—*
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Kuife, Siegfried; Karla, Heinz; and Frings, Gerd, to Saint-Gobain Industries. Electrical connecting terminal. 3,851,368, Cl. 29-203.00d.

Kuipers, Sytze Arnold. Turnbuckle. 3,851,978, Cl. 403-45.000.

Kumagai Gumi Company Limited: *See—*
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Kunak, Anthony F.: *See—*
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Kurimoto, Mikishi; Ochiai, Yoshiki; Nomura, Kenji; and Inagaki, Toshio. Machine tool with tool module storage and changing means. 3,851,380, Cl. 29-568.000.
Kuroda, Kazusuke; Naoi, Keigo; and Minorikawa, Hitoshi, to Hitachi, Ltd. Voltage protection circuit for transistor regulators. 3,852,653, Cl. 320-64.000.
Kuroiwa, Katumasa: *See—*
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Kusters, Edward: *See—*
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Labbe, Francis Auguste Maurice, to Mollins Limited. Cigarette making machines. 3,851,652, Cl. 131-84.00c.
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Lacoste, Emile Joseph, III. Structural system employing eight-sided polygonal units constructed of prefabricated elements. 3,851,427, Cl. 52-79.000.
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Lagasse, Guy. Adjustable door buck spreader. 3,851,868, Cl. 269-8.000.
Lahoud, Joseph A.; and Orphal, Dennis L., to Computer Sciences Corporation. Method and apparatus for preventing thermal pollution. 3,851,495, Cl. 62-260.000.
Laidig, Jonathan J.; and Boppart, Loren P., to Laidig Silo Unloaders, Inc. Bottom silo unloaders. 3,851,774, Cl. 214-17.0da.
Laidig Silo Unloaders, Inc.: *See—*
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Lalk, James W.; and Crear, Jobie, to Dow Chemical Company, The. Permanent anti snag finish for fabrics. 3,852,102, Cl. 117-139.05a.
Lambert, Ronald F., to Polaroid Corporation. Preparation of tertiary organophosphine oxides. 3,852,362, Cl. 260-606.50p.
Lambertsen, Christian J. Buoyant underwater structures. 3,851,487, Cl. 61-69.00r.
Lamming, Jack Stewart, to U.S. Philips Corporation, mesne. Method of manufacturing double diffused transistor with base region parts of different depths. 3,852,127, Cl. 148-187.000.
Lamping, Wolfram, to G.A.O. Gesellschaft fur Automation und Organisation mbH. Safety box or the like. 3,851,602, Cl. 109-23.000.
Land, Edwin H., to Polaroid Corporation. Photographic system for processing and projecting transparencies. 3,851,958, Cl. 352-130.000.
Landis & Gyr AG: *See—*
Niederberger, Felix; and Schweizer, Christian, 3,852,738.
Landry, Floyd J., Jr. Method of and device for coating lengths of linear elements. 3,851,623, Cl. 118-405.000.
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Lang, Roger J., to Spectra-Strip Corporation. Jig apparatus for use in stripping insulation from flat multi-conductor cable. 3,851,425, Cl. 51-217.000.
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Lappage, James: *See—*
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Lapper, Maurice Noel, to British Steel Corporation. Apparatus for measuring movement of a ferromagnetic member. 3,851,395, Cl. 33-141.00r.
Larsson, Agne. Scintillation camera with improved resolution. 3,852,598, Cl. 250-327.000.
Latash, Jury Vadimovich: *See—*
Paton, Boris Evgenievich; Thedorvar, Boris Izhailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Makhailovich; Artamonov, Viktor Leonidovich; Bodarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich, 3,852,510.
Laturnau, Eugene T. Liner inserting apparatus for masonry building blocks. 3,851,370, Cl. 29-211.00r.
Lauben, Robert W., to General Electric Company. Non-metallic load center having housing. 3,852,514, Cl. 174-58.000.
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Lay, Ralph B., to Cosco, Inc. Chair backrest reclining assembly. 3,851,918, Cl. 297-357.000.
Lazzarini, Louis P., 1/2 each to Hanscom, Genevieve I., Hanscom, Genevieve I., Magnuson, Robert, Magnuson, Roy M. and Thomson, Lois J.; trustees of the estate of. Dry peeling apparatus. 3,851,572, Cl. 99-451.000.
Lazzarini, Louis P.; and Smith, Traner J., to Hanscom, Genevieve I.; formerly Magnuson, Genevieve I., Hanscom, Genevieve I., Magnuson, Robert and Thomson, Lois J.; formerly Duggan, Lois J.; as trustees of the estate of Magnuson, Roy M.; deceased. Roller claning mechanism. 3,851,753, Cl. 198-229.000.
Le Maout, Theophile Francois: *See—*
Camboulives, Andre Alphonse Mederic Leon; Le Maout, Theophile Francois; Marchi, Marc Roger; and Vandenbroucke, Roger Alfred Jules, 3,851,900.
Le Tourneau, Richard L.; and Hall, Chester G., to IHC Holland-Le Tourneau Marine Corporation. Sectionalized leg for drilling platform and method of assembling same. 3,851,482, Cl. 61-46.500.
LeaBailly, Jacques; and Dubois, Jean-Claude, to U.S. Philips Corporation. Electroluminescent semiconductor device. 3,852,797, Cl. 357-19.000.
Leabailly, Jacques; and Dubois, Jean-Claude, to U.S. Philips Corporation. Electroluminescent device. 3,852,798, Cl. 357-19.000.
Leach, Roger; Doggett, Neil; and Lappage, James, to Platt International Limited. Manufacture of multi-fold yarns. 3,851,698, Cl. 57-91.000.
Leanza, William J.: *See—*
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Leavenworth, Howard W., Jr.; Dunning, Beverly W., Jr.; Gabler, Robert C., Jr.; and Goldsmith, Carl E., to United States of America, Interior. Formation of methal filaments by solid state reactions. 3,852,060, Cl. 75-.50b.
Lebail, Patrick, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Multiple sonde of the fourier transformation type. 3,852,745, Cl. 343-17.000.
Leblond, Jean Rene; and Biet, Jean Armand, to Uniroyal. Apparatus for applying a rubber strip onto a pneumatic tire carcass. 3,852,142, Cl. 156-395.000.
Lecourt, Michel: *See—*
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Lee, Raymond, Organization, Inc.: *See—*
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Lee, Raymond, Organization, Inc., The: *See—*
Brown, Joseph E., 3,851,756.
Hopkins, Nigel J., 3,851,558.
Lee, Tien Pei; and Li, Tingye, to Bell Telephone Laboratories, Incorporated. Graded bandgap semiconductor photodetector for equalization of optical fiber material delay distortion. 3,852,591, Cl. 250-211.00j.
Lehman, Carl Theodore, to United States Gypsum Company. Cement compositions containing alpha gypsum having improved long-term durability. 3,852,081, Cl. 106-89.000.
Leimgruber, Willy; Paestrone, Gian Paolo; and Mitrovic, Milan, to Hoffmann-La Roche Inc. Pharmaceutical compositions containing organometallic derivatives of 6-lower alkoxy-1-phenazine 5,10-dioxide. 3,852,442, Cl. 424-245.000.
Leitz, Ernst, GmbH: *See—*
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Lemelson, Jerome H. Method for finishing articles. 3,851,426, Cl. 51-319.000.
Leonard, William A.; Kunak, Anthony F.; Burns, Cecil M.; and Parsons, Warren N., to M. Lowenstein & Sons, Inc. Waterproof, breathable coated textile substrate. 3,852,090, Cl. 117-14.000.
Lepetjukha, Vladimir Semenovich: *See—*
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Musy, Jean-Pierre, 3,851,643.
Leuba, Jean-Pierre: *See—*
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Levenberg, Nathan. Automotive bumper and energy absorbing member therefor. 3,851,910, Cl. 293-89.000.
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Van Werven, Ferdinand Maria; and Bohlmeyer, Frits Peter, 3,852,487.

Levers, William E.; and Keith, Charles H., to Celanese Corporation. Apparatus for making filters. 3,852,007, Cl. 425-66.000.

Levin, Nathan; and Oliver, Thomas Anderson, Jr. Stop motion apparatus for knitting machines. 3,851,501, Cl. 66-163.000.

Levin, Robert E., to GTE Sylvania Incorporated. Omnidirectional light beacon with toroidal flash lamp. 3,852,584, Cl. 240-41.35r.

Levinos, Steven, to Keuffel & Esser Company. Photo-imaging utilizing uranyl compounds. 3,852,070, Cl. 96-48.00r.

Levy, Boris, to Polaroid Corporation. Silver halide with an orthorhombic lead monoxide and sensitizing dye. 3,852,066, Cl. 96-1.600.

Levy, Boris, to Polaroid Corporation. Photosensitive element with silver halide, a semiconductor and a sensitizing dye. 3,852,067, Cl. 96-1.600.

Lew, Isiah: *See—*
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Liblick, Herbert, to Distrib-U-Mat, Inc., mesne. Packaging assembly. 3,851,762, Cl. 206-425.000.

Licentia, Patent-Verwaltungs-G.m.b.H.: *See—*
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Lide, Basil M.; and Kowalcheck, Harry, to Westinghouse Electric Corporation. Multivibrator having two levels triggering capability after initiation. 3,852,621, Cl. 307-273.000.

Lieberman, Seymour; and Rice, Joseph Michael, to Transtech. Self operating pressure actuated valve. 3,851,660, Cl. 137-484.200.

Lienau, Rainer; and Hofmann, Friedrich, to Sud-Chemie Aktiengesellschaft. Method for the production of concentrated hydrohalogen acids and metal oxides. 3,852,430, Cl. 423-481.000.

Lieser, Ernst; Ort, Wolfgang; Wisst, Otto; and Hopfner, Clemens, to Eastman Kodak Company. Exposure control apparatus. 3,852,777, Cl. 354-49.000.

Light, George S. Dynamic pressurized condensing method. 3,852,162, Cl. 203-10.000.

Limpson, Alma A., Jr.; and Zitting, Gordon T. Machinery seal. 3,851,888, Cl. 277-206.000.

Lin, James: *See—*
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Lindberg, Martin, to A. Ahlstrom Osakeyhtio Noormarkku. Method and device for recovering glass fiber from glass felt rejects. 3,852,108, Cl. 134-2.000.

Linde Aktiengesellschaft: *See—*
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Lindemann, Martin K., to Tanner, Chase. S., Co. Thermosetting vinyl ester-ethylene emulsion copolymers. 3,852,233, Cl. 260-29.6ta.

Linder, Ernst: *See—*
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Lingenfelter, Robert C.; and Sabella, Andrew, to Westinghouse Electric Corporation. Vacuum switch with toggle assembly operating mechanism. 3,852,553, Cl. 200-153.00g.

Lippmann, Hans Joachim: *See—*
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Littler, Clarence A.; and Richards, Bert Lorin, Jr. Acid salts of 2-benzimidazolecarbamic acid, alkyl esters as fungicides. 3,852,460, Cl. 424-273.000.

Litton Systems, Inc.: *See—*
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Liu, John K., to Philadelphia Gear Corporation. Dynamometer testing using plural power asorption means. 3,851,524, Cl. 73-134.000.

Liu, Wen-Chih; and Rao, Koppaka V., to Pfizer & Co., Inc. Mitocromin and process for preparing same. 3,852,425, Cl. 424-114.000.

Liu, William C., 20% to Lee, Raymond, Organization, Inc. Cart convertible from wheel to skid transport. 3,851,891, Cl. 280-11.000.

Lizzio, Angelo A.: *See—*
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Ljudmirsky, Mark Lipovich; Forshtator, Georgy Mironovich; and Shkurovich, Yakov Solomonovich. Method of checking the position of a magnetic head relative to a magnetic recording medium and a test magnet recording medium for effecting said. 3,852,815, Cl. 30-75.000.

Loeffler, Earl Ferdnand: *See—*
Brey, Wilhelm; Hostetler, William; Loeffler, Earl Ferdnand; Kolm, Hubert Ernest; and Elder, Fred Grove, 3,852,143.

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Lohr, Delmar F., Jr.; and Kay, Edward L., to Firestone Tire & Rubber Company, The. Stabilization of polybutadiene resin. 3,852,229, Cl. 260-23.70m.

Lojek, Rudolf; Ryska, Josef; and Cechach, Frydlant V., to Zavody Elitex textilniho strojirenstvi generalni reditelstvi. Device for the continuous drying and finishing of web materials, particularly textiles. 3,851,408, Cl. 34-155.000.

Lone Star Steel Company: *See—*
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Martin, Willis Leon; Holland, Orvis L.; Ewan, Thomas K.; and Hurse, James E., 3,852,409.

Long, Olan L., to Westinghouse Electric Corporation. Support and leveling arrangement. 3,851,846, Cl. 248-188.200.

Lopke, Edward L.: *See—*
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Lorain Products Corporation: *See—*
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Lorkin, Clive Graham; and Schiffarth, Josef, to Foseco International Limited. Protection of graphite electrodes. 3,852,107, Cl. 117-228.000.

Low, William Wayne: *See—*
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Lowder, Dale E., to Clarke-Gravely Corporation. Floor scrubber flow divider. 3,851,349, Cl. 15-50.00r.

Lowell, Ross. Lighting arrangement for photographic work. 3,852,582, Cl. 240-1.300.

Lowenschuss, Oscar; and Roy, Rob, to Raytheon Company. Pulse compression radar. 3,852,746, Cl. 343-17.2pc.

Lowenstein, M., & Sons, Inc.: *See—*
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Lucas Electrical Company Limited, The: *See—*
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Luce, John B., to General Electric Company. Flame retardant polycarbonate composition. 3,852,238, Cl. 260-45.75r.

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Lundberg, Robert D.; and Makowski, Henry S., to Exxon Research and Engineering Company. Process for fabricating an article from a multiphase copolymer composition. 3,852,096, Cl. 117-47.00h.

Lura, Yukio: *See—*
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M & J Valve Company: *See—*
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Ma, John, to Zenith Radio Corporation. Tuner with integral input filter. 3,852,670, Cl. 325-357.000.

MacDonald, Copthorne: *See—*
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MacKenzie, Kenneth H. Coupling. 3,851,983, Cl. 403-312.000.

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Madrid, Raymond. Apparatus for making sopaipillas and the like. 3,851,569, Cl. 99-407.000.

Maeda, Mitsuaki: *See—*

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Takemura, Satoshi; Harakon, Katsuyuki; Maeda, Mitsuaki; Sakai, Noboru; and Hamano, Etsuko, 3,851,693.

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Magnino, Pete Joseph; Hozr, Ralph Anthony; and Hahn, Robert Erick, to Ralston Purina Company. Method of making puddings containing soy protein. 3,852,503, Cl. 426-364.000.

Magnum Automotive Equipment, Inc.: *See—*
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Magnuson, Robert: *See—*
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Mahler, Walter, to Du Pont de Nemours, E. I., and Company. Preparation of perchlorofluorobenzenes. 3,852,365, Cl. 260-650.00f.

Maier, Alfred E.; and Shimp, Alan B., to Westinghouse Electric Corporation. Circuit braker fault simulator. 3,852,660, Cl. 324-28.00r.

Maiocco, Humbert Luciano, to Beloit Corporation. Oriented removal structure for an injection molding machine. 3,852,011, Cl. 425-242.00r.

Majumdar, Amalendu Jyoti, to National Research Development Corporation. Fibre reinforced cement. 3,852,082, Cl. 106-99.000.

Makhijani, Manik P.; and Scacciaferro, Frank, to International Business Machines Corporation. Semiconductor chip fixture. 3,851,758, Cl. 206-328.000.

Makishima, Sumio. Pavement surface treating apparatus. 3,851,921, Cl. 299-37.000.

Makowski, Henry S.: *See—*
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Mallory, P. R., & Co., Inc.: *See—*
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Malzahn, Wayne Robert, to Ralston Purina Company. High protein ready-to-eat breakfast cereal. 3,852,491, Cl. 426-346.000.

Mamula, Milan: *See—*
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Mandel, Alan F.: *See—*
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Maness, Dale D., to Exxon Research and Engineering Company. Methods for the preparation of improved faujasite compositions. 3,852,411, Cl. 423-329.000.

Mansfield, Donald R.: *See—*
White, Neil S.; Mansfield, Donald R.; and Matthews, Noel H., 3,851,834.

Mansfield Sanitary, Inc.: *See—*
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Flinner, Vaughn D.; Sprang, Richard W.; Zody, Dana D.; and Fulton, Howard A., 3,851,339.

Manteghian, Allen A.: *See—*
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Manufacturers Brush Company, The: *See—*
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Marathon Oil Company: *See—*
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Argabright, Perry A.; Presley, C. Travis; and Davis, John A., 3,852,100.
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Marchacek, Jiri: *See—*
Vit, Jaroslav; Casewsky, Bohuslav; Mamula, Milan; and Marchacek, Jiri, 3,852,262.

Marchand, Jacques J., to First Dynamics, Inc. Machine for producing filled two-lidded plastic containers with a drinking straw and a puncturable depression in each lower lid. 3,851,441, Cl. 53-116.000.

Marchi, Marc Roger: *See—*
Camboulives, Andre Alphonse Mederic Leon; Le Maout, Theophile Francois; Marchi, Marc Roger; and Vandenbroucke, Roger Alfred Jules, 3,851,900.

Marco, Leslie Stephan. Nurser bottle construction. 3,851,781, Cl. 215-11.00e.

Marconi Company Limited, The: *See—*
Blakemore, Thomas Raymond, 3,852,753.
Watson, Barry Kenneth, 3,852,689.

Marconi Instruments Limited: *See—*
Dawe, Christopher; and Middleton, John David, 3,852,682.

Marik, Charles J.; Shlachter, Bernard; and Slavik, William H., to Motorola, Inc. Phase shifting network. 3,852,624, Cl. 307-295.000.

Marine Industries Incorporated: *See—*
Foster, Merrill J., 3,851,630.

Mario, Pagani: *See—*
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Marks, Mortimer: *See—*
Kent, Arthur P.; and Marks, Mortimer, 3,851,955.

Marks Polarized Corporation: *See—*
Kent, Arthur P.; and Marks, Mortimer, 3,851,955.

Marshall, Harold G., to United States of America, Agriculture. Single cone multiple-row plot seeder. 3,851,802, Cl. 222-162.000.

Martignoni, Pasquale: *See—*
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Martin, Claude R. Rear end loader. 3,851,780, Cl. 214-766.000.

Martin, Henry; and Drabek, Jozef, to Ciba Limited. Pesticidal compositions containi.,g 1-halo-2-aryloxy-vinyl-(2)-phosphates. 3,852,438, Cl. 424-217.000.

Martin, James C., to Warwick Electronics Inc. Variable Q IF amplifier. 3,852,522, Cl. 178-5.80r.

Martin, Willis Leon: *See—*
Ewan, Thomas K.; Holland, Orvis L.; Martin, Willis Leon; and Hurse, James E., 3,852,408.

Martin, Willis Leon; Holland, Orvis L.; Ewan, Thomas K.; and Hurse, James E., to Lone Star Steel Company. Process for the removal of particulate matter and acidic gases from carrier gases. 3,852,409, Cl. 423-242.000.

Martyn, Viktor Makhailovich: *See—*
Paton, Boris Evgenievich; Thedorvar, Boris Izhailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Makhailovich; Artamonov, Viktor Leonidovich; Bodarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich, 3,852,510.

Maschinenfabrik Buckau R. Wolf Aktiengesellschaft: *See—*
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Maschinenfabrik J. Dieffenbacher & Co.: *See—*
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Maschinenfabrik Zell J. Krueckels KG: *See—*
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Maslenok, Boris Arkadievich; Khegai, Anatoly Sergeevich; Zlobin, Viktor Grigorievich; Mednitsky, Viktor Georgievich; Genkin, Lev Isaakovich; Petrichenko, Nikolai Fed. rovich; and Mitrofanov, Boris Ivanovich. Control rod drive in a nuclear reactor. 3,852,153 Cl. 176-36.00r.

Mason, Burton H., to Atmospheric Diving Systems, Inc. Method and apparatus for underwater operations. 3,851,491, Cl. 61-69.00r.

Mason, Edwin E., to Design Elements, Inc. Solenoid drive circuit. 3,852,646, Cl. 317-141.00s.

Massa, Turco: *See—*
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Masse, Lucien: *See—*
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Masturs, Michele: *See—*
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Masuda, Katsutada: *See—*
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Masuzawa, Isao; Awano, Tsuneo; and Onishi, Kazutoshi, to Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.). Servo apparatus for marine autopilot. 3,852,650, Cl. 318-588.000.

Matburn (Holdings) Limited: *See—*
Cook, Ronald Joseph, 3,851,870.

Matoba, Hajime: *See—*
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Matsuda, Shigeo; and Obara, Nasoshi, to Modern Electronic Instrument Corporation. Alarm apparatus utilizing high frequency. 3,852,735, Cl. 340-258.00c.

Matsumoto, Tetsuo: *See—*
Yaguchi, Hiromichi; Tachibana, Kameo; and Matsumoto, Tetsuo, 3,852,126.

Matsuo, Masao: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Matsushita, Kunijiro, to Kumagai Gumi Company Limited. Construction pile having fluid injection means. 3,851,490, Cl. 61-53.740.

Mattell, Inc.: *See—*
Adler, Seymour; Nuttall, Fleet E.; and Shapero, Wallace H., 3,852,389.

Matthews, Noel H.: *See—*
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Matzek, Norman E., to Dow Chemical Company, The. Stabilization of aluminum hydride. 3,852,043, Cl. 23-293.000.

Mauri, Francesco: *See—*
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Ziggiotti, Antonio; Mauri, Francesco; and Riva, Giovanna, 3,852,271.

Maurischat, Guenther; and Mueller, Juergen, to Agfa-Gevaert Aktiengesellschaft. Apparatus for conditioning sheets of photosensitive materials. 3,851,403, Cl. 34-48.000.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
Wulff, Heinrich, 3,852,061.
Maxey, Frank S., to Goodyear Tire & Rubber Company, The. Vulcanization system containing a three-component accelerator system. 3,852,250, Cl. 260-79.50b.
Maxey, Frank S., to Goodyear Tire & Rubber Company, The. Two-component accelerator system for vulcanizable rubbers. 3,852,251, Cl. 260-79.50b.
Maxson, Orwin G.; and Achenbach, Gary D., to Continental Oil Company. Method for insulating a borehole. 3,851,704, Cl. 166-292.000.
Maxwell, Richard F., Jr.; Coyle, Forrest E.; and Gillespie, George W., to Westinghouse Electric Corporation. Pressure actuatable switch apparatus with bellows and fluid damping means. 3,852,546, Cl. 200-83.00c.
Mayr, Bertold; Henning, Richard; and Schweiger, Erwin, to Bayerische Motoren Werke Aktiengesellschaft. Cooling installation for piston internal combustion engines. 3,851,629, Cl. 123-41.080.
Mazelsky, Bernard, to ARA Products, Inc. Method of assemblying energy absorbers. 3,851,374, Cl. 29-455.000.
McAfee, Donald A.; and Newcomb, Thomas P., to General Motors Corporation. Method of inoculating nodular cast iron. 3,851,700, Cl. 164-57.000.
McCarthy, Brian D., to Sanders Associates, Inc. Cathode ray tube circuit. 3,852,640, Cl. 315-27.0gd.
McCleerey, Earl W.; and English, William A., to Westinghouse Electric Corporation. Magnetically coupled control for cooking platform. 3,852,558, Cl. 219-10.490.
McClelland, Ronald O., to Koppers Company, Inc. Coke quenching car alignment indicating system. 3,852,159, Cl. 202-227.000.
McClintock, Earl A. Apparatus for conserving the use of water electricity and the like in automatic film processors. 3,852,793, Cl. 354-324.000.
McColgin, William C.: *See*—
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McCord Corporation: *See*—
Weller, Peter A., 3,852,150.
McCowan, Thomas R.; and Ritter, Thomas E. Storage device. 3,851,938, Cl. 312-117.000.
McCoy, Robert Gordon, to Bell Telephone Laboratories, Incorporated. Hook Latch. 3,851,922, Cl. 292-111.000.
McCullough, Edward E.; Zundel, Kerry G.; and Binggeli, La Ron D., to Thiokol Corporation, mesne. Inspection instrument. 3,852,526, Cl. 178-7.100.
McCurdy, Donald L., to Amerock Corporation. Single and double cylinder deadlocks. 3,851,508, Cl. 70-370.000.
McDonald, Bernard, to Medical Testing Systems, Inc. Medical examining instrument. 3,851,642, Cl. 128-18.000.
McDonald, George B., to Control Data Canada, Ltd. Nozzle area measurement. 3,852,741, Cl. 343-5.00r.
McDonald, John C.: *See*—
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McGinnis, Bernard W.: *See*—
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McGlothlin, Raymond E.: *See*—
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McGrath, Ronald P.; and Bleher, William A., to General Instrument Corporation, mesne. Self-clocking NRZ recording and reproduction system. 3,852,810, Cl. 360-51.000.
McIlwain, Irwin D.: *See*—
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McIntyre, Raymond D., to Varian Associates. Transmission ion chamber. 3,852,610, Cl. 250-385.000.
McKibbin, John M., to National Steel Corporation. Sheet material dispenser and blank for assembling the same. 3,851,809, Cl. 225-20.000.
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McLaughlin, Ivan Patrick: *See*—
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Medical Environment Devices Incorporated: *See*—
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Medical Testing Systems, Inc.: *See*—
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Meier, Johann; and Minusio, Brione Sopra. Method for determining the translucency and/or turbidity of a medium and appararus for applying the method. 3,851,976, Cl. 356-206.000.
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Merkle, Ralph H.; and Humbert, Malcolm H., to General Motors Corporation. Mounting assembly for exhaust pipe. 3,851,673, Cl. 138-106.000.
Merritt, William Lipscomb: *See*—
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Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Kolesikova, Nina Ivnovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,852,431.

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Meyer, Rich B., Jr.; Shuman, Dennis A.; and Robins, Roland K., to ICN Pharmaceuticals, Inc. Phosphoramidates of 3',5'-cyclic purine nucleotides. 3,852,267, Cl. 260-211.50r.

Meyer, W. Keith, to Gulf Research & Development Company. Drilling liquid containing microcrystalline cellulose. 3,852,200, Cl. 252-8.50a.

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Michalak, Wilhelm, to Leitz, Ernst, G.m.b.H. Sighting device for artillery guns. 3,851,400, Cl. 33-240.000.

Michaud, Roger P.; and Cordes, Jacques. Electric heater unit. 3,852,567, Cl. 219-365.000.

Mick, Stanley H., to General Motors Corporation. Carburetor. 3,852,381, Cl. 261-50.00a.

Miculka, Zdenek; Janirek, Vladislav; Rektorik, Vladimir; and Hanacek, Josef, to Strojosvit, nardni podnik. Continuous ironing and pressing machine for flat materials. 3,851,414, Cl. 38-49.000.

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Mila, Truman R., to GTE Automatic Electric Laboratories, Incorporated. Arrangement and method of combining trunks and a matrix into a single frame. 3,852,538, Cl. 179-91.00r.

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Miles, Bernard. Apparatus for forming, interleaving and dispensing food patties. 3,851,442, Cl. 53-122.000.

Miller, Edward T., 8% to Pollard, R. J. Fluid translator. 3,852,001, Cl. 418-196.000.

Miller, Franz-Friedrich: *See—*
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Miller, John H. Snap-on leak proof clamp. 3,851,671, Cl. 138-99.000.

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Mills, M. Dee. Pump-off control apparatus for a pump jack. 3,851,995, Cl. 417-12.000.

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Mohren, Manfred: *See—*
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Monestere, Martin, Jr.; and Vaillancourt, Vincent L., to Bard, C. R., Inc. Intravenous catheter introduction assembly. 3,851,647, Cl. 128-214.400.

Monsanto Company: *See—*
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Montgomery, James R., to General Motors Corporation. Reflex reflector. 3,851,947, Cl. 350-103.000.

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Moon, Lawrence Michael; and Timms, Herbert W., to Timms, Herbert W. Remote vending control apparatus. 3,852,577, Cl. 235-92.0fl.

Moore, Albert J.; Haggart, James A., Jr.; and Foster, Michael R., to General Motors Corporation. Low profile catalytic converter. 3,852,041, Cl. 23-288.00r.

Moore, Bill: *See—*
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Moore, Lee C.: *See—*
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Moore, Richard W. Cryopreservation of equine cell cultures. 3,852,155, Cl. 195-1.800.

Moore, William P.: *See—*
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Moorman, Earl J. Magnetically operating switch. 3,852,692, Cl. 335-205.000.

Moos, Ervin A., to Thexton Manufacturing Company. Pressure-actuated drum dispenser. 3,851,796, Cl. 222-39.000.

Morand, Jean Francis, to Electronique Marcel Dassault. Device for neutralizing a fire-control radar. 3,852,747, Cl. 343-18.00e.

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Morii, Kokichi, to Sony Corporation. Automatic frequency control circuit. 3,852,686, Cl. 331-177.00v.

Morimoto, Naoki, to Fujitsu Limited. Character recognizing system. 3,852,715, Cl. 340-146.30z.

Morisaki, Nobukazu, to Daido Metal Company Limited. Sliding bearing member. 3,852,203, Cl. 252-12.000.

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Motovilin, Alexandr Vasilievich: *See—*
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Kolesikova, Nina Ivnovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,852,431.

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Muehllehner, Gerd, to Nuclear-Chicago Corporation. Tomographic imaging device. 3,852,603, Cl. 250-369.000.

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Murakami, Kenkichi, to Kabushiki Kaisha Plastic Kogaku Kenkyusho. Dialyzing apparatus for artificial kidney. 3,852,198, Cl. 210-321.000.

Murata, Yorihiro; and McMurtry, Carl H., to Carborundun Company, The. Solid diffusion sources for phosphorus doping. 3,852,086, Cl. 106-286.000.

Murayama, Naohiro; and Katto, Takayuki, to Kurcha Kagaku Kogyo Kabushiki Kaisha. Method for production of shaped carbon articles. 3,852,429, Cl. 423-449.000.

Murray, Fletcher A., to Uniroyal, Inc. Missing pick sensor. 3,851,680, Cl. 139-348.000.

Murray, John C.: *See—*
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Murtin, Fernand R. C.; Mercier, Loic; and Barat, Jean, to Societe Industrielle d'Electronique et d'Informatique. Electronically controlled fuel-supply system for compression-ignition engine. 3,851,635, Cl. 123-139.00e.

Musy, Jean-Pierre, to Les Produits Associes, SA. On-off arrangement for a liquid jet hand appliance. 3,851,643, Cl. 128-66.000.

Muz, Edwin. Electrical plug-and-socket-connector, especially for communications engineering applications. 3,852,704, Cl. 339-252.00p.

Mylari, Banavara L.; and Brennan, Thomas M., to Pfizer Inc. Sulfenylation of N-arylheterocyclic compounds. 3,852,289, Cl. 260-248.0as.

Myller, Rolf. Three dimensional sheet puzzle. 3,851,884, Cl. 273-157.00r.

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Nagano, Yuji; and Sato, Iwao. Process for sterilizing foodstuffs and beverages. 3,852,476, Cl. 426-7.000.

Nagasawa, Takeshi; Kuroiwa, Katumasa; and Narita, Kouichi, to Nitto Boseki Co. Ltd. Thiocarbonates. 3,852,290, Cl. 260-251.00r.

Nagase, Tsuneyuki; Suzukamo, Gohu; and Fukao, Masami, to Sumitomo Chemical Company, Limited. Isomerization of alkenyl-alkoxybenzenes. 3,852,305, Cl. 260-340.900.

Nagashima, Shinichiro; and Tsuchiya, Kaichi, to Canon Inc. Photoconductive toner composition. 3,852,208, Cl. 252-62.100.

Nagle, Eugene Michael: *See—*
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Nakagawa, Jihei, to Olympus Optical Company Limited. Photographic lens system having short overall length and large aperture ratio. 3,851,953, Cl. 350-215.000.

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Nakamura, Yoshithugu: *See—*
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Nakano, Kinichi; and Nishiyama, Norio, to Kyowa Hakko Kogyo Kabushiki Kaisha. Process for producing copyamycin derivatives. 3,852,426, Cl. 424-120.000.

Nakase, Yasukiyo; and Kojima, Yasuhiko, to Kitasato Institute Tokyo, Japan, The. Interferon inducer and process for preparing the same. 3,852,423, Cl. 424-115.000.

Nakataki Pharm Industry Co., Inc.: *See—*
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Nakayama, Kiyoshi; and Tanaka, Haruo, to Kyowa Hakko Kogyo Co., Ltd. Process for the preparation of 6-azauracil ribotide. 3,852,156, Cl. 195-28.00n.

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National Rejectors Inc., GmbH: *See—*

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National Research Development Corporation: *See—*
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National Safe Corporation: *See—*
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National Steel Corporation: *See—*
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Natsuda, Hisayuki; Mori, Hirohumi; and Matoba, Hajime, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Photo-degradable polyolefin resin compositions. 3,852,227, Cl. 260-23.00h.

Neal, Albert D. Trimming attachment. 3,851,390, Cl. 30-276.000.

Neelen, Gregorius Theodorus Maria, to U.S. Philips Corporation. Hot-gas engine. 3,851,472, Cl. 60-517.000.

Neibuhr, Stuart G.; and Zeitner, Edward J., Jr., to General Motors Corporation. Stabilization of nickel boride catalyst in potassium hydroxide electrolytes. 3,852,116, Cl. 136-120.0fc.

Neitzel, Ulrich E. G.; Flint, Hans Gerhard; and Lukes, Jerome A., to Great Salt Lake Minerals & Chemical Corporation. Recovery of substantially potassium-free hydrated magnesium chloride from contaminated aqueous solutions. 3,852,044, Cl. 23-298.000.

Nelson, Donald F. Balanced steerable power transmission. 3,851,614, Cl. 115-35.000.

Nelson, Everett J., to Boeing Company, The. Four-quadrant multiplier-notch filter demodulator. 3,852,672, Cl. 328-1.000.

Nelson, John Russell: *See—*
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Nelson, Leon Franklin, to Deere & Company. Forage harvester. 3,851,450, Cl. 56-14.400.

Nelson, Robert E.; and Watts, Oran A., III, to General Motors Corporation. Timing circuit. 3,852,623, Cl. 307-293.000.

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Neuville, Calaude, to Compteurs Schlumberger. Demodulator. 3,852,677, Cl. 329-109.000.

Neuville, Claude, to Compteurs Schlumberger. Static remote-control relay selection system. 3,852,722, Cl. 340-172.500.

New England Fish Company: *See—*
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New England Nuclear Corporation: *See—*
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Nicholas, Harold J.; and Knapp, Furn F., Jr. Ergosteryl esters having liquid crystalline properties. 3,852,311, Cl. 260-397.200.

Nichols, Herbert F.; and Bauman, Joel, to Bauman, Joel, mesne. Electronic thermometer. 3,851,528, Cl. 73-362.0ar.

Nichols, John Francis, to Nichols Products, Inc. Apparatus and method for encapsulating eggs. 3,851,571, Cl. 99-450.600.

Nichols Products, Inc.: *See—*
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Nickstadt, Gerhard A., to General Electric Company. Gear drive reversing mechanism. 3,851,537, Cl. 74-404.000.

Nicolon N.V.: *See—*
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Nicoud, Jean-Daniel, to Sodec/Saia. Identity card reader. 3,852,572, Cl. 235-61.11e.

Niederberger, Felix; and Schweizer, Christian, to Landis & Gyr AG. Ripple-control receiver responsive to multiple command control. 3,852,738, Cl. 340-310.000.

Nienhaus, Clemens; Pieper, Rudolph; and Eickenbusch, Hubert, to Walterscheid, Jean, GmbH. Coupler for connecting tubular members. 3,851,903, Cl. 285-341.000.

Nihon Denshi Kabushiki Kaisha: *See—*
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Nii, Takeshi. Collapsible chair. 3,851,914, Cl. 297-45.000.

Niimi, Itaru; Kaneko, Yasuhisa; Noguchi, Masamitu; Uchida, Tsuneo; and Katori, Youhei, to Toyota Jidosha Kogyo Kabushiki Kaisha. Heat resistant, anti-corrosive alloys for high temperature service. 3,852,063, Cl. 75-124.000.

Nijdam-Paffen, Maria Magdalena Mathilda: *See—*
Kooi, Else; DeWerdt, Reinier; and Nijdam-Paffen, Maria Magdalena Mathilda, 3,852,104.

Nikawitz, Edward J.; Tavares, Robert F.; and Easter, William M., Jr., to Givaudan Corporation. Odorant compositions including 2-butyl -1-alkynylcycloalkan-1-ols and derivatives thereof. 3,852,219, Cl. 252-522.000.

Nikitsch, Erhard; Putscher, Johann; and Utschig, Peter, to Agfa-Gevaert Aktiengesellschaft. Photographic apparatus. 3,852,792, Cl. 354-213.000.

Nikonova, Tatyana Vladimirovna: *See—*
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Kolesikova, Nina Ivnovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,852,431.

Nims, Jerry Curtis; and Wah Lo, Allen Kwok, to Dimensional Development Corporation. Three dimensional pictures and method of composing them. 3,852,787, Cl. 354-275.000.

Ninomiya, Nobutaka; and Kunii, Daizo, to Takeda Chemical Industries, Ltd. Process for producing coarse particles of active carbon in a fluidized bed with added inert particles. 3,852,216, Cl. 252-421.000.

Nippon Kogaku K.K.: *See—*
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Nippon Piston Ring Co., Ltd.: *See—*
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Nippon Seisen Co., Ltd.: *See—*
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Nippon Typewriter Co., Ltd.: *See—*
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Nischk, Gunther: *See—*
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Nishimura, Seiichiro, to Bridgestone Tire Company Limited. Method and apparatus for finishing pneumatic tires. 3,851,697, Cl. 157-13.000.

Nishiyama, Norio: *See—*
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Nishumura, Hideo; and Haga, Kyosuke, to Toyoda Koki Kabushiki Kaisha. Pitch error compensation system. 3,852,719, Cl. 340-172.500.

Nisper, Kenneth J., to Questor Corporation. Reciprocating system and hydrodynamic piston ring therefor. 3,851,889, Cl. 277-214.000.

Nissan Motor Company, Limited: *See—*
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Hosaka, Akio; and Wazawa, Kiyoshi, 3,852,717.

Nitto Boseki Co. Ltd.: *See—*
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NL Industries, Inc.: *See—*
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Noa, Fritz; and Mohren, Manfred, to Schiess Aktiengesellschaft. Automatic tool changing arrangement. 3,851,364, Cl. 29-26.00a.

Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Control arrangement for a camera shutter. 3,852,776, Cl. 354-31.000.

Noguchi, Kazuo; Iwai, Shigeru; Sato, Yukihiro; and Kitamura, Yoshiaki, to Kabushiki Kaisha Daini Seikosha. Industrial robot. 3,851,769, Cl. 214-1.0bc.

Noguchi, Masamitu: *See—*
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Noguchi, Masaru, to Alps Motorola, Inc. Driving mechanism for a load with inertia. 3,851,499, Cl. 64-27.00s.

Nomura, Kenji: *See—*
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Norbro Pneumatics Limited: *See—*
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Nordson Corporation: *See—*
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Nordyke, John S.; and Spangenberg, William C. Composite pigment for blocking tannin. 3,852,087, Cl. 106-288.00b.

Noren, Donald W.: *See—*
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Norris Industries, Inc.: *See—*
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Northern Natural Gas Company: *See—*
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Northrup, Leonard L., Jr. Electrical switching system. 3,852,695, Cl. 337-102.000.

Norton, Richard V.: *See—*
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Norton, Robert K., to Harris-Intertype Corporation. Plate clamp registering mechanism. 3,851,583, Cl. 101-415.100.

Notgrass, James Burl. Automatic tilting safety transmission adapter base. 3,851,857, Cl. 254-134.000.

Nottke, James E., to Du Pont de Nemours, E. I., and Company. Cyanoperfluoro(vinyl ethers), their preparation and copolymers thereof. 3,852,326, Cl. 260-465.600.

Novagard Corporation: *See—*
Sitter, Matthew M.; Meyers, Robert M.; and Kutch, Edward F., 3,852,149.

Novello, Frederick C.: *See—*
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Nowak, James A.: *See—*
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Nuclear-Chicago Corporation: *See—*
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Nukina, Shogo: *See—*
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Nuttall, Fleet E.: *See—*
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Obara, Nasoshi: *See—*
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Oborsh, Edward V.: *See—*
Brown, Arthur V., Jr.; and Oborsh, Edward V., 3,852,492.

Oborsh, Edward V.; and Mohrman, Robert K., to Ralston Purina Company. Intermediate moisture food with monoglyceride and propylene glycol preservative. 3,852,483, Cl. 426-94.000.

Obstfelder, Guenther: *See—*
Kreutze, Gerhard; Moessner, Manfred; Obstfelder, Guenther; Soehring, Gerhard; and Pfirrman, Victor, 3,851,959.

Oce-van der Grinten N.V.: *See—*
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Ochiai, Yoshiki: *See—*
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Tomita, Tamaki; and Ochiai, Yoshiki, 3,851,562.

Oetiker, Hans. Stratifier with a pneumatic product recirculation. 3,852,168, Cl. 209-469.000.

O.F.R. Officine Fratelli Riello S.p.A.: *See—*
Medeot, Renzo; and Cianfrone, Francesco, 3,852,022.

Ogawa, Kinya: *See—*
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Ogihara, Masayoshi: *See—*
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Ogihara, Masuo; and Yonemoto, Tomoo, to Seiko Koki Kabushiki Kaisha. Self-timer for a camera. 3,852,785, Cl. 354-239.000.

Ogura, Isamu; Miyashita, Takaaki; and Aida, Yoshimoto, to Oki Electric Industry Co., Ltd. Magnetic plated wire memory device. 3,852,725, Cl. 340-174.0bc.

Ohi, Akira: *See—*
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Ohren, Tom H., to Procter & Gamble Company, The. Detergent compositions. 3,852,211, Cl. 252-110.000.

Ohwada, Atsushi; and Arnold, John A., to Texas Instruments Incorporated. One transistor dynamic memory cell. 3,852,800, Cl. 357-24.000.

Oji Yuka Goseishi Kabushiki Kaisha and Sanyo Chemical Industries Ltd.: *See—*
Miyabe, Yoshio; Fujimoto, Takehiko; Nukina, Shogo; and Suwada, Ataru, 3,852,249.

Okazaki, Sirou; and Ito, Kenjiro, to Nippon Typewriter Co., Ltd. Electric braille recording and reproducing system. 3,851,745, Cl. 197-6.100.

Okazaki, Yasuhisa: *See—*
Hamanaka, Hiroyoshi; Okazaki, Yasuhisa; and Yoshijima, Hiroshi, 3,852,314.

Oki Electric Industry Co., Ltd.: *See—*
Ogura, Isamu; Miyashita, Takaaki; and Aida, Yoshimoto, 3,852,725.

Okigami, Noboru: *See—*
Itoh, Takusen; Onose, Kenji; Ueda, Takayoshi; Okigami, Noboru; and Miyabayashi, Iwao, 3,852,023.

Olczyk, Franciszek: *See—*
Jozwicki, Ryszard; Kubica, Henryk; Ankudowicz, Waclaw; Jedryka, Tadeusz; Roszewska, Irena; Kurzyniec, Stanislaw; Swietoslawski, Roman; and Olczyk, Franciszek, 3,851,455.

O'Leary, Kevin P., to Minnesota Mining & Manufacturing Company. Heat-sensitive copy-sheet. 3,852,093, Cl. 117-36.800.

Olin Corporation: *See—*
Caule, Elmer J., 3,852,130.
Crane, Jacob; Friedman, Sam; and Pryor, Michael Joseph, 3,852,121.
Pryor, Michael J.; and Popplewell, James M., 3,852,148.

Oliver, Thomas Anderson, Jr.: *See—*
Levin, Nathan; and Oliver, Thomas Anderson, Jr., 3,851,501.

Olivetti, Ing., C., & C., S.p.A.: *See—*
Guglielmi, Nicolo; Vittone, Settimo; and Rolando, Gianfranco, 3,852,172.

Olson, Donald O. In-line emitter for hose. 3,851,896, Cl. 285-14.000.

Olson, Irving G.; and Landskov, Hardy K., to United States of America, Navy. Polypole broadband antenna array. 3,852,766, Cl. 343-844.000.

Olson, Maylin J.: *See—*
Case, Charles B.; Hebert, David M.; Olson, Maylin J.; and Schubert, John C., 3,851,789.

Olson, Richard L.: *See—*
Fraser, Sheila J.; Gillette, Roger B.; and Olson, Richard L., 3,851,436.

Olympia Werke AG: *See—*
Sicking, Heinrich; and Rittberg, Eilt-Heyo, 3,852,773.

Olympus Optical Company Limited: *See—*
Nakagawa, Jihei, 3,851,953.

OMEGA Louis Brandt & Frere S.A.: *See—*
Ravussin, Pierre-Emile; and Vuille, Jean-Pierre, 3,851,974.

Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, to Seiko Koki Kabushiki Kaisha. Shutter assembly having means for damping the rapid motion of the shutter blades. 3,852,786, Cl. 354-252.000.

Onda, Yoshiro: *See—*
Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, 3,852,421.

Onishi, Kazuo: *See—*
Ichioka, Satoshi; Onishi, Kazuo; Inoue, Tadashi; Ono, Hirohisa; and Takeuchi, Shinjiro, 3,852,525.

Onishi, Kazutoshi: *See—*
Masuzawa, Isao; Awano, Tsuneo; and Onishi, Kazutoshi, 3,852,650.

Ono, Hirohisa: *See—*
Ichioka, Satoshi; Onishi, Kazuo; Inoue, Tadashi; Ono, Hirohisa; and Takeuchi, Shinjiro, 3,852,525.

Onose, Kenji: *See—*
Itoh, Takusen; Onose, Kenji; Ueda, Takayoshi; Okigami, Noboru; and Miyabayashi, Iwao, 3,852,023.

Optical Systems Corporation: *See—*
Court, Patrick R. J., 3,852,519.

Oratronics Incorporated: *See—*
Weiss, Charles M.; and Lew, Isiah, 3,851,393.

Orphal, Dennis L.: *See—*
Lahoud, Joseph A.; and Orphal, Dennis L., 3,851,495.

Ort, Wolfgang: *See—*
Lieser, Ernst; Ort, Wolfgang; Wisst, Otto; and Hopfner, Clemens, 3,852,777.

Osaka Soda Co., Ltd.: *See—*
Yokota, Noriyuki; Watanabe, Nobuatsu; Tokuda, Shingo; and Shimizu, Hirokatsu, 3,852,113.

Osakeyhtio, A. Ahlstrom: *See—*
Rantala, Pekka Paivio, 3,851,407.

Osborn, Charles W.; and Milam, Paul B., Jr., to Phillips Petroleum Company. Clearer polyefins by combination of aryl carboxlic acid phthalocyanine, and quinacridone. 3,852,237, Cl. 260-42.210.

Osipov, Vyacheslav Stepanovich: *See—*
Brodov, Valery Fedorovich; Osipov, Vyacheslav Stepanovich; Zhdanov, Mikhail Dmitrievich; Burov, Anatolievich; Kovalev, Fedor Lukich; But, Anatoly Illarionovich; Ivanov, Vadim Georgievich; Belyaev, Nikolai Nikolaevich; and Bashev, Lev Alexandrovich, 3,852,01.

Osterman, Sven-Olof: *See—*
Knutsen, Tryggve Lund; and Osterman, Sven-Olof, 3,852,260.

O'Sullivan, David D.: *See—*
White, Marvin H.; O'Sullivan, David D.; and Hamel, Richard G., 3,851,531.

Otten, Gottfried: *See—*
Pause, Kurt; Dregger, Ernst Ullrich; and Otten, Gottfried, 3,851,818.

Ottenstein, Sidney Allan, to M & J Valve Company. System and method for locating breaks in liquid pipelines. 3,851,521, Cl. 73-40.50r.

Oudijk, Tommy A.: *See—*
Correll, Quentin E.; Swain, Allan L.; Oudijk, Tommy A.; Chamness, Leland D.; and Rudin, Melvin, 3,851,580.

Ougusa, Yasuhiro: *See—*
Ishikawa, Narimasa; Suzuki, Susumu; Ougusa, Yasuhiro; and Arai, Koozo, 3,852,225.

Owada, Akihito: *See—*
Sugahara, Eisuke; Yagi, Yusaku; and Owada, Akihito, 3,851,741.

Owen, Ronald P., to Rohm and Haas Company. Preparation of 4-(2-(furfurylideneamino)-phenyl)-3-thioallophanates. 3,852,278, Cl. 260-240.00a.

Owen, William John; Cooper, Bryan Ewart; and Westall, Stephen, to Dow Corning Limited. Process for treating surfaces. 3,852,097, Cl. 117-93.310.

Owens-Corning Fiberglas Corporation: *See—*
Roberson, Cletis L., 3,851,453.

Owens-Illinois, Inc.: *See—*
Hoehn, Harold J.; and Ernsthausen, Roger E., 3,852,607.
Peters, Edwin F., 3,852,609.
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Oxenrider, Bryce C.: *See—*
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Oxford Industries, Inc.: *See—*
Fields, Jack W.; and Camp, Robert D., 3,851,807.

Oxlade, Roy Ronald, to British Iron & Steel Research Association, The. Rolling mill work roll assemblies. 3,851,365, Cl. 29-125.000.

Packard Instrument Company, Inc.: *See—*
Smith, Roy E., 3,852,599.

Paestrone, Gian Paolo: *See—*
Leimgruber, Willy; Paestrone, Gian Paolo; and Mitrovic, Milan, 3,852,442.

Pagdin, Brian Colin, to GKN Transmissions Limited. Transmission overheating engine shutdown control for self propelled vehicles. 3,851,723, Cl. 180-103.000.

Pagdin, Brian Colin, to GKN Transmissions Limited. Braking systems. 3,851,928, Cl. 303-21.9cg.

Palermiti, Frank M.; Goldberg, Eugene P.; and Melton, Carl W., to Xerox Corporation. Chemical reproduction systems. 3,851,584, Cl. 101-470.000.

Palmason, Einar Henry, to Johnson, A., & Co., Inc. Process for separating hydrocarbon materials. 3,852,166, Cl. 208-347.000.

Paoletti, Jean-Claude, to Societe de Fabrication et de Distribution de Parfumerie et Cosmetique Diparco S.A. Valve for the distribution under pressure of a liquid or paste product. 3,851,799, Cl. 222-145.000.

Paoli, Stephen A. Machine for processing bone-in meat cuts. 3,851,828, Cl. 241-68.000.

Paolini, Frank Rudolph, to Pepi Inc. X-ray diffraction apparatus. 3,852,594, Cl. 250-278.000.

Papai, Imre F. Pastry shell filling apparatus. 3,851,554, Cl. 83-165.000.

Park, Hen Suh. Method and apparatus for automatically generating Korean character fonts. 3,852,720, Cl. 340-172.500.

Parke, Davis & Company: *See—*
Fisher, James, 3,852,333.

Parker, Edward H.; Harris, Edward M.; and Meador, Jim D., to Klestern Litho Plate & Supply Co. Photopolymers. 3,852,256, Cl. 260-89.300.

Parker, Norman W.: *See—*
Caprio, Gerald L.; and Parker, Norman W., 3,852,807.

Parker-Hannifin Corporation: *See—*
Blanchard, Roger H.; and Clark, Charles R., 3,851,852.

Parkinson, James R. Thrust-meter utilizing a phase measurement system for thrust measurement. 3,851,525, Cl. 73-140.000.

Parkison, Richard G.; and Fichter, Barry S., to American Standard Inc. Leak-proof laminar flow device. 3,851,825, Cl. 239-590.300.

Parry, Frank, to Branson Instruments, Incorporated. Ultrasonic seaming and cutting apparatus. 3,852,144, Cl. 156-510.000.

Parsons, David: *See—*
Bainbridge, Wilfred Nicholas; Parsons, David; and Hodkinson, Harold, 3,851,473.

Parsons, Warren N.: *See—*
Leonard, William A.; Kunak, Anthony F.; Burns, Cecil M.; and Parsons, Warren N., 3,852,090.

Pasero, Edoardo: *See—*
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Pasha, Mohiuddin: *See—*
Rivers, Richard D.; Pasha, Mohiuddin; Huntington, Robert G.; Goldsmith, Jesse M.; and Pring, Robert T., 3,852,410.

Pasieka, John F.: *See—*
Kennedy, C. Bruce; and Pasieka, John F., 3,852,783.

Patel, Hiralal V.: *See—*
Chen, Karl K.; and Patel, Hiralal V., 3,851,514.

Paton, Boris Evgenievich; Thedorvar, Boris Izhailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Makhailovich; Artamonov, Viktor Leonidovich; Bodarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich. Method of electroslag remelting and device effecting. 3,852,510, Cl. 13-18.000.

Paton, Charles R.: *See—*
Grunert, Kurt A.; Paton, Charles R.; and Sentak, John A., 3,852,544.

Patterson, James A.: *See—*
Patterson, James A.; and Finke, Eugene D., 3,852,092.

Patterson, James A.; and Finke, Eugene D., to Patterson, James A. and Finkle, Eugene D. Thermally responsive elastic membrane. 3,852,092, Cl. 117-36.700.

Pauli, Otto: *See—*
Paulus, Wilfried; and Pauli, Otto, 3,852,471.

Paulik, Frank E.: *See—*
Forster, Denis; Hershman Arnold; and Paulik, Frank E., 3,852,346.

Paulus, Wilfried; and Pauli, Otto. Synergistic microbiocidal composition employing certain phenols and a benzyl alcohol. 3,852,471, Cl. 424-334.000.

Pause, Kurt; Dregger, Ernst Ullrich; and Otten, Gottfried, to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft. Apparatus for discharging the contents of a discontinuously operating centrifuge. 3,851,818, Cl. 233-22.000.

Pavlov, Leonid Viktorovich: *See—*
Paton, Boris Evgenievich; Thedorvar, Boris Izhailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Makhailovich; Artamonov, Viktor Leonidovich; Bodarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich, 3,852,510.

Paxton, David J.: *See—*
Hoffman, Stanley A.; and Paxton, David J., 3,851,968.

Peach, Robert W. Expansion joint for slabs of concrete roadways. 3,851,989, Cl. 404-50.000.

Peak, Leonard R. Portable animal feed bunk and method of feeding stacked or baled hay. 3,851,624, Cl. 119-60.000.

Pearson, Gerald L.; and Foggiato, Giovanni A., to Leland Stanford Junior University, The Board of Trustees of the. High speed bulk semiconductor microwave switch. 3,852,794, Cl. 357-3.000.

Pease, Bradford K.: *See—*
Reinbold, Richard J.; Rudzki, Eugene M.; and Pease, Bradford K., 3,852,028.

Pechous, Leslie Joseph: *See—*
Davis, James L.; Lopke, Edward L.; and Pechous, Leslie Joseph, 3,851,464.

Peczeli, Charles F.; and Tyrcz, Edward T., to Gulf Oil Canada Limited. Method for admixing combustion air in a burner. 3,852,020, Cl. 431-9.000.

Pedershaab Maskinfabrik A/S: *See—*
Holme, Bent Melchior Karlsen, 3,852,018.

Peirce, C. Condit: *See—*
Reid, Walter L., Jr.; Peirce, C. Condit; and Pelletier, Raymond G., 3,851,367.

Pelletier, Raymond G.: *See—*
Reid, Walter L., Jr.; Peirce, C. Condit; and Pelletier, Raymond G., 3,851,367.

Peltz, Hanns-Heinz. Method of contacting a semiconductor body habing a plurality of electrodes utilizing sheet metal electric leads. 3,851,383, Cl. 29-591.000.

Penfold, Garn Farley: *See—*
Agness, Jay Byron; Ziegler, Duane Herbert; and Penfold, Garn Farley, 3,851,451.

Penkova, Joseph A.: *See—*
Bertolino, August U.; Penkova, Joseph A.; and Carrell, William G., 3,852,550.

Pennsylvania Engineering Corporation: *See—*
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Pennwalt Corporation: *See—*
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Peperone, Joseph D.: *See—*
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Pepi Inc.: *See—*
Paolini, Frank Rudolph, 3,852,594.

Pepkowski, Michael Paul; and Houle, Guy Jean. Chess game device. 3,851,885, Cl. 273-136.00b.

Perlman, I. Lee, to Technicon Instruments Corporation. Apparatus for treatment of solids for analysis. 3,851,826, Cl. 241-46.110.

PermaCraft Corporation: *See—*
Kimball, Jerome Watis; and Kimball, Kenny Harrell, 3,852,014.

Perri, Giulio Cesare: *See—*
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Perry, Thomas C., Jr.: *See—*
Roberson, James H.; and Perry, Thomas C., Jr., 3,851,924.

Peters, Edwin F., to Owens-Illinois, Inc. Control apparatus for supplying operating potentials. 3,852,609, Cl. 315-169.0tv.

Petersen, Christian C., to Polaroid Corporation. Method and circuit for recording audio signals on magnetic tape. 3,852,813, Cl. 360-66.000.

Peterson, Clyde O., to Westinghouse Electric Corporation. Deceleration measuring apparatus. 3,851,522, Cl. 73-84.000.

Petrichenko, Nikolai Fedorovich: *See—*
Maslenok, Boris Arkadievich; Khegai, Anatoly Sergeevich; Zlobin, Viktor Grigorievich; Mednitsky, Viktor Georgievich; Genkin, Lev Isaakovich; Petrichenko, Nikolai Fedorovich; and Mitrofanov, Boris Ivanovich, 3,852,153.

Petro-Tex Chemical Corporation: *See—*
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Pettitt, David J.: *See—*
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Pevrick Engineering Co., Inc.: *See—*
Hedrick, John R., 3,851,715.

Pevzner, Leonid Mikhailovich: *See—*
Titov, Dmitry Vladimirovich; Rotenburg, Alexandr Aronovich; and Pevzner, Leonid Mikhailovich, 3,851,679.

Peyser, Harry A.; and Ruekberg, Herbert S., to Continental Can Company, Inc. Dispenser with nozzle cut-off. 3,851,806, Cl. 222-555.000.

Pfeiffer, Heinrich, to Maschinenfabrik J. Dieffenbacher & Co. Continuously operating panel press. 3,852,012, Cl. 425-363.000.

Pfirrman, Victor: *See—*
Kreutze, Gerhard; Moessner, Manfred; Obstfelder, Guenther; Soehring, Gerhard; and Pfirrman, Victor, 3,851,959.

Pfizer & Co., Inc.: *See—*
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Pfizer Inc.: *See—*
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Faubl, Hermann, 3,852,322.
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Pfluger, Gerhard; and Bolz, Ludwig, to Bosch, Robert, G.m.b.H. Starter for internal combustion engines. 3,851,532, Cl. 74-7.00a.

Pharmacia Aktienbolag: *See—*
Bjork, Lars; Erikson, Uno Eugen; Granath, Kirsti Annikki; Ingelman, Gustav-Adolf; and Lindberg, Bernt Jabes, 3,852,341.

Philadelphia Gear Corporation: *See—*
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Philco-Ford Corporation: *See—*
Fassell, Wayne M., 3,852,124.
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Philico-Ford Corporation: *See—*
Kell, Howard A., Jr.; Yeager, Eugene W.; and Manteghian, Allen A., 3,852,691.

Philips Broadcasting Equipment Corporation: *See—*
Van Roessel, Frederik J., 3,852,674.

Philips Petroleum Company: *See—*
Hutchinson, William M., 3,852,299.

Phillips, Donald D.; and Ward, Loyal F., Jr.; deceased (by Ward, Melba L.; executrix), to Shell Oil Company. 2-Chlorovinyl ethyl isopropyl phosphoramidate and 2-chlorovinyl ethyl diethyl phosphoramidate. 3,852,396, Cl. 260-957.000.

Phillips Petroleum Company: *See—*
De Vault, Albert M.; and Johnson, Marvin M., 3,852,252.
Osborn, Charles W.; and Milam, Paul B., Jr., 3,852,237.
Smith, Ernest L., 3,851,813.
Walker, Darrell W.; Bertus, Brent J.; and Farha, Floyd, Jr., 3,852,369.

Phillips, Ronald Frank, to Arizona Chemical Company, mesne. $SiCl_4$-$AlCl_3$ cocatalyst system. 3,852,218, Cl. 252-442.000.

Piaget, Dorothy R.: *See—*
Piaget, Robert Edgar; and Piaget, Robert Edward, 3,851,946.

Piaget, Robert Edgar; deceased (by Piaget, Dorothy R.; executrix); and Piaget, Robert Edward. Cable connecting assembly. 3,851,946, Cl. 339-259.00r.

Piaget, Robert Edward: *See—*
Piaget, Robert Edgar; and Piaget, Robert Edward, 3,851,946.

Piazza, Andre L.; and Vujasinovic, Ado N., to Rucker Company, The. Well connector. 3,851,897, Cl. 285-18.000.

Picker Corporation: *See—*
Slagle, Edward, 3,851,644.

Pickles, Joseph; and Duckworth, Albert, to Ferro Manufacturing Corporation. Windshield wiper drive. 3,851,351, Cl. 15-250.250.

Pieper, Rudolf: *See—*
Fracke, Aribert; Klein, Heinrich; Pieper, Rudolf; Weber, Eduard; and Wachtler, Hans, 3,851,404.

Pieper, Rudolph: *See—*
Nienhaus, Clemens; Pieper, Rudolph; and Eickenbusch, Hubert, 3,851,903.

Pihlaja, Eino. Tire remover. 3,851,696, Cl. 157-1.200.

Pike, John E.: *See—*
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Pillon, Marcel Octave, to Pont-A-Mousson S.A. and Societe Emballages Monles. Method and machine for constructing a rectangular sided packing around an object of any shape. 3,851,439, Cl. 53-29.000.

Pillsbury Company, The: *See—*
Katz, Morris H.; and Brandberg, Lawrence C., 3,851,574.
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Piquerez, Ervin, S.A.: *See—*
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Piquerez, Pierre Michel, to Piquerez, Ervin, S.A. Watch time display illumination. 3,851,460, Cl. 58-50.00a.

Piret, Jean; and Quemerais, Philippe, to Regie Nationale des Usines Renault and Ste Automobiles Peugeot. Hydraulic circuits for controlling automatic gear boxes. 3,851,547, Cl. 74-869.000.

Pittet, Alan O.: *See—*
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Placek, Eugene W., to International Magna Corporation. Infra-red heater. 3,852,025, Cl. 431-329.000.

Plastics, Inc.: *See—*
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Platonov, Vladimir Nikiforovich: *See—*
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Platt International Limited: *See—*
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Ploss, Helmut; and Hildebrandt, Hans-Joachim, to Warner Electric Brake & Clutch Company. Differential ball nut assembly. 3,851,541, Cl. 74-459.000.

Plumat, Emile; Van Laethem, Robert; Colignon, Pierre; Wasterlain, Michel; and Votquenne, Pierre, to Glaverbel S.A. Production of laminated glazing. 3,852,136, Cl. 156-103.000.

Plunkett, Larry D., to Signode Corporation. Pneumatically operated tool. 3,851,371, Cl. 29-243.560.

Pocrnja, Anton; and Wenzel, Heribeft, to Linde Aktiengesellschaft. Method for defogging a roadway, landing strip or the like. 3,851,822, Cl. 239-2.00r.

Polaroid Corporation: *See—*
Augustin, Rolf M., Jr.; and Moodie, Donald E., 3,852,780.
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Lambert, Ronald F., 3,852,362.
Land, Edwin H., 3,851,958.
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Levy, Boris, 3,852,067.
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Polis, Yanis Jurievich; and Grava, Ilze Yanovna. Method of producing alpha-methyl-l-adamantylmethyl-amine hydrochloride. 3,852,352, Cl. 260-563.00r.

Pollard, R. J.: *See—*
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Pollution Control Technology, Inc.: *See—*
Grengg, Walter M., 3,852,604.

Polson, Jerry H. Coupling method and device for animal mountable electronic package. 3,852,758, Cl. 343-718.000.

Polyaninova, Nina Ivanovna: *See—*
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Kolesikova, Nina Ivnovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,852,431.

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Pontarella, Armand. Pneumatic legging for horses. 3,851,447, Cl. 54-82.000.

Popov, Vyacheslav Evgenievich: *See—*
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Potts, Herbert Alexander: *See—*
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Potvin, Alfred M., to Heetco Ltee. Electric grill. 3,852,569, Cl. 219-525.000.

Powell, Brent L.: *See—*
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Powell, John Lawrence; Winter, Peter John; and Pritchard, Ernest, to Coal Industry (Patents) Limited. Manufacture of carbon fibres. 3,852,428, Cl. 423-447.000.

PPG Industries, Inc.: *See—*
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Cross, Christopher G., 3,852,141.
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Prahl, Franz: *See—*
Gebhardt, Hans; Prahl, Franz; and Schorwerth, Mathias, 3,851,738.

Prahl, Klaus, to IPOS Gesellschaft fur integrierte Prothesen Entwicklung und orthopadietechnischen Service m.b.H. & Co., KG. Universally movable ankle joint for tube skeleton artificial limbs. 3,851,337, Cl. 3-32.000.

Prasad, Raj Nandan; and Stein, Herman Hal, to Abbott Laboratories. Inosine-5-carboxylic acid amides. 3,852,268, Cl. 260-211.50r.

Preci-Spark Limited: *See—*
Jones, Ralph Godfrey, 3,851,754.

Prelog, Vladimir: *See—*
Gaeumann, Ernst; Prelog, Vladimir; Vischer, Ernst; and Bickel, Hans, 3,852,424.

Presentey, Shelley M. Special belt and pulley rim transmission device. 3,851,535, Cl. 74-229.000.

Presisjon Mek. Verksted A/S: *See—*
Grundvig, C.; and Thorvaldsen, B., 3,851,615.

Presley, C. Travis: *See—*
Argabright, Perry A.; and Presley, C. Travis, 3,851,479.
Argabright, Perry A.; Presley, C. Travis; and Davis, John A., 3,852,100.
Kimmel, Albert L.; Argabright, Perry A.; and Presley, C. Travis, 3,852,220.

Presto Lock Company; Division of Kidde, Walter, & Company, Inc.: *See—*
Gehrie, Charles S., 3,851,507.

Prigent, Raymond: *See—*
Chenault, Roger; and Prigent, Raymond, 3,852,589.

Pring, Robert T.: *See—*
Rivers, Richard D.; Pasha, Mohiuddin; Huntington, Robert G.; Goldsmith, Jesse M.; and Pring, Robert T., 3,852,410.

Pritchard, Ernest: *See—*
Powell, John Lawrence; Winter, Peter John; and Pritchard, Ernest, 3,852,428.

Privon, George T.: *See—*
Barry, Vincent T.; and Privon, George T., 3,852,648.

Prochazka, Svante, to General Electric Company. Dense silicon carbide ceramic and method of making same. 3,852,099, Cl. 117-119.000.

Procter & Gamble Company, The: *See—*
Basadur, Marino Sidney, 3,852,075.
Kooistra, John A., Jr., 3,852,441.
Ohren, Tom H., 3,852,211.

Projetud: *See—*
Romain, Jean Claude, 3,851,477.

Pryor, Michael J.; and Popplewell, James M., to Olin Corporation. Architectural products formed of glass or ceramic-to-metal composites. 3,852,148, Cl. 161-41.000.

Pryor, Michael Joseph: *See—*
Crane, Jacob; Friedman, Sam; and Pryor, Michael Joseph, 3,852,121.

Pugin, Andre: *See—*
Zographos, Georgeos; Pugin, Andre; and Burdeska, Kurt, 3,852,064.

Purcell, Robert J., to Caterpillar Tractor Company. Counterweight assembly for vehicle-mounted implement. 3,851,712, Cl. 172-801.000.

Putscher, Johann: *See—*
Nikitsch, Erhard; Putscher, Johann; and Utschig, Peter, 3,852,792.

Puyplat, Olivier, to Cibie Projecteurs. Headlamp. 3,852,583, Cl. 240-41.35r.

Pyle, Owen, to Kingsford Company, The. Process for producing industrial fuel from waste woody materials. 3,852,048, Cl. 48-209.000.

Pyles, Gerald Dee, to RCA Corporation. Tape cartridge player mechanism. 3,852,818, Cl. 360-92.000.

Quaker Oats Company, The: *See—*
Charter, Wayne M., 3,851,570.

Quanrud, Larry D.: *See—*
Andres, William A.; Quanrud, Larry D.; Koppa, Charles J.; Becker, Larry F.; Christoffersen, William K.; and Keely, James L., 3,851,950.

Quariullo, Orpheus F. Big game fishing chair. 3,851,916, Cl. 297-188.000.

Quemerais, Philippe: *See—*
Piret, Jean; and Quemerais, Philippe, 3,851,547.

Questor Corporation: *See—*
Nisper, Kenneth J., 3,851,889.

Quinn, Ronald E., to General Motors Corporation. Internal recirculation burner. 3,852,021, Cl. 431-116.000.

Quirk, Virgil P., to Stackpole Carbon Company. Fail-safe electric water heater. 3,852,566, Cl. 219-311.000.

Quoos, Kurt: *See—*
Ahrweiler, Karl-Heinz; Appenzeller, Valentin; Quoos, Kurt; and Kusters, Edward, 3,851,685.

Radlmann, Eduard; and Nischk, Gunter, to Bayer Aktiengesellschaft. Acrylonitrile -(Co) -polymers with reduced surface resistance. 3,852,254, Cl. 260-85.50r.

Raetzsch, Carl W., Jr.; and Cunningham, Hugh, to PPG Industries, Inc. Bipolar diaphragm electrolytic cell having internal anolyte level equalizing means. 3,852,179, Cl. 204-256.000.

Ralston Purina Company: *See—*
Brown, Arthur V., Jr.; and Oborsh, Edward V., 3,852,492.
Magnino, Pete Joseph; Hozr, Ralph Anthony; and Hahn, Robert Erick, 3,852,503.
Malzahn, Wayne Robert, 3,852,491.
Oborsh, Edward V.; and Mohrman, Robert K., 3,852,483.

Ram Domestic Products Company: *See—*
Romanelli, Pat, 3,852,726.

Ransburg Corporation: *See—*
Bentley, Stanley L., 3,851,618.

Rantala, Pekka Paivio, to Osakeyhtio, A. Ahlstrom. Drying apparatus for a wrinkled paper web. 3,851,407, Cl. 34-155.000.

Rao, Koppaka V.: *See—*
Liu, Wen-Chih; and Rao, Koppaka V., 3,852,425.

Rapko, John N.; and Harken, Russel D., to Monsanto Company. Carboxymethyl dioxolane polycarboxylates. 3,852,306, Cl. 260-340.900.

Rapp, James Erich, to Owens-Illinois, Inc. Glasses, glass-ceramics and process for making same. 3,852,077, Cl. 106-39.600.

Rautenstrauch, Valentin; and Naf, Ferdinand, to Firmenich S.A. Cycloaliphaic unsaturated ketones as odour- and taste-modifying agents. 3,852,355, Cl. 260-586.00r.

Ravizza S.A.: *See—*
Ziggiotti, Antonio; Mauri, Francesco; and Riva, Giovanna, 3,852,271.

Ravussin, Pierre-Emile; and Vuille, Jean-Pierre, to OMEGA Louis Brandt & Frere S.A. and Alcyon Electronique et Physique S.A. System for optical alignment and adjustment of a laser. 3,851,974, Cl. 356-153.000.

Raychem Corporation: *See—*
Del Fava, Donald A., 3,852,517.

Raynaud, Guy M.: *See—*
Fauran, Claude P.; Turin, Michel J.; Raynaud, Guy M.; and Gouret, Claude J., 3,852,284.

Raytheon Company: *See—*
Backman, William R., Jr.; and Walsh, George M. (said Walsh assor. to), 3,852,705.
Lowenschuss, Oscar; and Roy, Rob, 3,852,746.
Works, George A.; Murray, John C.; and Freedman, Nathan, 3,852,755.

Razdirek, Jiri V., to Textron, Inc. Feed mechanism for a thread roller. 3,851,513, Cl. 72-90.000.

RCA Corporation: *See—*
Bogner, Bruce Fredric, 3,852,761.
Gange, Robert Allen; Nagle, Eugene Michael; and Steinmetz, Carl Charles, 3,851,948.
Hale, John Richard, 3,852,105.
Hulls, Leonard Robin, 3,852,664.
Pyles, Gerald Dee, 3,852,818.
Rosen, Arye; and Reynolds, James Francis, 3,852,680.
Ross, Daniel Louis; and Barton, Lucian Anthony, 3,852,771.
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Christman, Robert D.; McKinney, Joel D.; and Readal, Thomas C., 3,852,186.
Christman, Robert D.; McKinney, Joel D.; Readal, Thomas C.; and Yanik, Stephen J., 3,852,187.

Reck, Richard A.; and Abramitis, Walter W., to Akzona Incorporated, mesne. Plant hormone carboxylic acid salts of aliphatic polyamines. 3,852,340, Cl. 260-501.10c.

Recognition Equipment: *See—*
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Reed Industries, Inc.: *See—*
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Reed, Marion G.: *See—*
Hawkes, George R.; Hodgson, Clive; Reed, Marion G.; and Toland, William G., 3,852,055.

Reed, William R., Jr.: *See—*
Hibbs, Louis E., Jr.; Darrow, Kenneth A.; and Reed, William R., Jr., 3,852,049.

Reehil, Edward G.; and Steiner, Edward L., to Xerox Corporation. Reproduction apparatus. 3,851,966, Cl. 355-17.000.

Reese, Joe, to United States of America, Navy. Electrically small resonant antenna with capacitively coupled load. 3,852,756, Cl. 343-708.000.

Regel, Erik: *See—*
Draber, Wilfried; Regel, Erik; Buchel, Karl Heinz; Eue, Ludwig; and Schmidt, Robert R., 3,852,056.

Reggia, Frank, to United States of America, Army. Electrically small dipolar antenna utilizing tuned LC members. 3,852,760, Cl. 343-747.000.

Regie Nationale des Usines Renault: *See—*
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Reid, Paul A.: *See—*
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Reid, Robert C.: *See—*
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Reid, Robert E.: *See—*
Kablaoui, Mahmoud S.; Godfrey, Arthur W.; and Reid, Robert E., 3,852,205.

Reid, Walter L., Jr.; Peirce, C. Condit; and Pelletier, Raymond G., to Dole Electro-Systems, Incorporated. Machine for installing probe elements into laminated floor structure. 3,851,367, Cl. 29-203.00r.

Reinbold, Richard J.; Rudzki, Eugene M.; and Pease, Bradford K., to Bethlehem Steel Corporation. Apparatus for preheating scrap. 3,852,028, Cl. 432-162.000.

Reinehr, Ulrich: *See—*
Bentz, Francis; Brokmeier, Dieter; Reinehr, Ulrich; and Nischk, Gunther, 3,852,255.

Reinicke, Ralf: *See—*
Baum, Hans; Reinicke, Ralf; and John Dieter, 3,851,581.
Baum, Hans; Reinicke, Ralf; and John, Dieter, 3,852,564.

Reisfeld, Frederick, to Potter Instrument Company, Inc. Symmetrical direct current tunnel erasing. 3,852,812, Cl. 360-66.000.

Rektorik, Vladimir: *See—*
Miculka, Zdenek; Janirek, Vladislav; Rektorik, Vladimir; and Hanacek, Josef, 3,851,414.

Reliance Electric Company: *See—*
Williams, Roger B., Jr., 3,851,720.

Relyea, Kenneth D.; and Santangelo, John A., to Drustar Unit Dose Systems, Inc. Transport apparatus for unit dose containers of pharmaceutical materials. 3,851,940, Cl. 312-234.500.

Remick, Ralph B., Jr.: *See—*
Andrews, Richard A.; and Remick, Ralph B., Jr., 3,851,529.

Remmele, Walter: *See—*
Eichler, Dieter; and Remmele, Walter, 3,851,469.

Renn-Cupit Industries Ltd.: *See—*
Dessert, Jean Marcel, 3,851,378.

Renold Limited: *See—*
Foster, Kenneth William; and Wallace, Neil McIntosh, 3,852,004.

Repetto, Silvio, to Sp.A. Luigi Rizzi & C. Skin dressing machine. 3,851,423, Cl. 51-78.000.

Research Filter- und Patentforschungs-Ges. m.b.H., Firma: *See—*
Jakubek, Peter; and Biswanger, Karl, 3,852,193.

Reth, Erich, to DEMAG Aktiengesellschaft. Method and apparatus for finishing a rolling bar using a displaceable intermediate stand between two end roll stands. 3,851,510, Cl. 72-12.000.

Rexnord Inc.: *See—*
Mihulowicz, George, 3,851,862.

Reynard, Fred T.; Feldpush, Donald E.; and Schibinger, Joseph S., to Burroughs Corporation. Two bit binary divider. 3,852,581, Cl. 235-164.000.
Reynolds, James Francis: *See—*
Rosen, Arye; and Reynolds, James Francis, 3,852,680.
Rheinstahl Aktiengesellschaft: *See—*
Kassel, Walter Dopper; Hausler, Dietrich; and Kohler, Walter, 3,851,829.
Ribich, William A.; and Russell, David B., to American Velcro Inc. Fastener. 3,851,357, Cl. 24-73.00p.
Rice, James S., to Industrial Nuclionics Corporation. Control system and method for machine or process having dead time. 3,852,578, Cl. 235-151.100.
Rice, Joseph Michael: *See—*
Lieberman, Seymour; and Rice, Joseph Michael, 3,851,660.
Rice, Sherman L. Flexible coupling. 3,851,498, Cl. 64-12.000.
Richards, Bert Lorin, Jr.: *See—*
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Richards, David W.: *See—*
Skelcey, James S.; Richards, David W.; and Hart, Alan M., 3,852,497.
Richardson, Kenneth. Line laying apparatus. 3,851,489, Cl. 61-72.600.
Richardson-Merrell Inc.: *See—*
Carr, Albert A., 3,852,455.
Grisar, Johann Martin; and MacKenzie, Robert Douglas, 3,852,269.
Usdin, Myron G., 3,852,420.
Richardson-Merrell S.p.A.: *See—*
Viterbo, Rene; Mastursi, Michele; and Perri, Giulio Cesare, 3,852,296.
Richier: *See—*
Durand, Pierre, 3,851,767.
Richmond Manufacturing Company, The: *See—*
Barnes, Thomas W., 3,851,716.
Richter, Sidney B.; and Stach, Leonard J., to Velsical Chemical Corporation. Herbicides and fungicides. 3,852,345, Cl. 260-545.00r.
Ricoh Co., Ltd.: *See—*
Tabata, Yasuhiro; and Ukai, Takeshi, 3,851,963.
Riemhofer, Franz: *See—*
Biethan, Uwe; Dorffel, Jorg; Hornung, Karl-Heinz; and Riemhofer, Franz, 3,852,375.
Rinehart, Jay K.: *See—*
Hardies, Donald E.; and Rinehart, Jay K., 3,852,464.
Ringwall, Carl G., to United States of America, Army, mesne. Fluidic frequency filter. 3,851,670, Cl. 137-814.000.
Rinke, Wilfried: *See—*
Schimpf, Franz-Wilhelm; and Rinke, Wilfried, 3,852,495.
Risley, Curtis A., to GTE Sylvania Incorporated. Communication receiving apparatus employing several samples of baseboard noise to detact an incoming signal and turn on the apparatus. 3,852,671, Cl. 325-492.000.
Ritch, Glen L. Hockey-type game apparatus. 3,851,880, Cl. 273-128.00r.
Rittberg, Eilt-Heyo: *See—*
Sicking, Heinrich; and Rittberg, Eilt-Heyo, 3,852,773.
Ritter, Thomas E.: *See—*
McCowan, Thomas R.; and Ritter, Thomas E., 3,851,938.
Riva, Giovanna: *See—*
Ziggiotti, Antonio; Ticino, Vezia; Riva, Giovanna; and Mauri, Francesco, 3,852,270.
Ziggiotti, Antonio; Mauri, Francesco; and Riva, Giovanna, 3,852,271.
Rivazza S.A.: *See—*
Ziggiotti, Antonio; Ticino, Vezia; Riva, Giovanna; and Mauri, Francesco, 3,852,270.
Rivers, Richard D.; Pasha, Mohiuddin; Huntington, Robert G.; Goldsmith, Jesse M.; and Pring, Robert T., to American Air Filter Company, Inc. Sulfur dioxide and particulate contaminant removal from industrial stack gases. 3,852,410, Cl. 423-244.000.
Roberson, Cletis L., to Owens-Corning Fiberglas Corporation. Apparatus for and method of packaging linear material. 3,851,453, Cl. 57-34.00r.
Roberson, James H.; and Perry, Thomas C., Jr., to Crompton & Knowles Corporation. Fiber distribution apparatus. 3,851,924, Cl. 320-28.000.
Roberson, James H., to Crompton & Knowles Corporation. Fiber distribution system. 3,851,925, Cl. 302-28.000.
Roberson, Lewis Shepherd: *See—*
Garner, Kenneth Bishop; and Roberson, Lewis Shepherd, 3,851,516.
Roberts, H. Evan; and Gickler, Alan E., to Binkley Company, The. Fastening means for joining members. 3,851,435, Cl. 52-754.000.
Roberts, John D.; Ellenberg, John D.; and Keith, Charles H., to Celanese Corporation. Filter making apparatus. 3,852,009, Cl. 425-83.000.
Roberts, John S.; and Cresswell, Michael C., to Westinghouse Electric Corporation. Selective low level irradiation to improve blocking voltage yield of junctional semiconductors. 3,852,612, Cl. 250-492.000.
Roberts, Victor B.; Stephenson, Charles V.; and Good, Robert E., Jr. Alarm system having pulse pair coding. 3,852,713, Cl. 340-164.00r.
Robertshaw Controls Company: *See—*
Tyler, Hugh J., 3,852,570.
Robertson, H. H., Company: *See—*
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Robins, Roland K.: *See—*
Meyer, Rich B., Jr.; Shuman, Dennis A.; and Robins, Roland K., 3,852,267.
Robinson, Donovan L., to General Motors Corporation. Gas turbine engine power shift transmission power train. 3,851,463, Cl. 60-39.160.
Robinson, Gilbert A. Message display device. 3,852,528, Cl. 178-7.880.
Robinson, Jack A., to Acme-Lite Manufacturing Co. Universal mount for electronic flash unit. 3,852,790, Cl. 354-145.000.
Robinson, Joseph D., to Shell Oil Company. Pulsed neutron capture logging for determining residual oil. 3,852,593, Cl. 250-259.000.
Robinson, Klas Robert William. Disconnectible pipe union. 3,851,902, Cl. 285-334.200.
Robson, Harry E., to Exxon Research and Engineering Company. Hydrodesulfurization of hydrocarbon feedstocks with a catalyst composite of chrysotile and Group VIB and/or Group VIII hydrogenation component. 3,852,165, Cl. 208-216.000.
Rochester Instrument Systems, Inc.: *See—*
Hollands, Daniel H., 3,852,731.
Rockerath, John L., to Jetsew, Inc. Sewing machine cutting machanism. 3,851,605, Cl. 112-130.000.
Rocklin, Albert L., to Shell Oil Company. Allyl 2-2-dinitropropyl carbonate. 3,852,320, Cl. 260-463.000.
Rockwell, Dick Gordon: *See—*
Eschholz, Harald, 3,851,369.
Rockwell International Corporation: *See—*
Wolfshagen, Ronald G., 3,851,500.
Wood, Robert L.; and Frederickson, Lyle R., 3,852,751.
Zeldman, Maurice I., 3,851,536.
Rodrigo Disenos S.A.C.I.: *See—*
Rodrigo, Ismael S., 3,851,915.
Rodrigo, Ismael S., to Rodrigo Disenos S.A.C.I. Folding and stacking chair. 3,851,915, Cl. 297-56.000.
Rody, Jean: *See—*
Moser, Paul; and Rody, Jean, 3,852,297.
Roelofs, Hendrik: *See—*
Wesselink, Gustaaf Adolf; and Roelofs, Hendrik, 3,852,630.
Roelofs, Wendell; Comeau, Andre; and Hill, Ada. Trans-8-trans-10-dodecadien-1-ol as an attractant. 3,852,419, Cl. 424-84.000.
Roess, Dieter; and Zeidler, Guenter, to Siemens Aktiengesellschaft. Laser device comprising a compound oscillator and amplifier for generating the fundamental mode. 3,852,684, Cl. 331-94.500.
Rogers, Edward J.; and Evans, David, to S&C Electric Company. Adjustable cam multiple contact switch arrangement. 3,852,542, Cl. 200-31.00r.
Rohm and Haas Company: *See—*
Owen, Ronald P., 3,852,278.
Rokudo, Nerumitsu: *See—*
Hori, Makoto; Rokudo, Nerumitsu; and Ishiguro, Toshiyuki, 3,851,823.
Rolando, Gianfranco: *See—*
Guglielmi, Nicolo; Vittone, Settimo; and Rolando, Gianfranco, 3,852,172.
Romain, Jean Claude, to Lecourt, Michel, Grenot, Bernard and Projetud. Device for protecting works against liquid masses. 3,851,477, Cl. 61-4.000.
Romanelli, Pat, to Ram Domestic Products Company. Remote meter monitor. 3,852,726, Cl. 340-188.00r.
Roosa, Vernon D. Flushing device. 3,851,338, Cl. 4-41.000.
Rorer, William H., Inc.: *See—*
Diamond, Julius, 3,852,364.
Rosen, Arye; and Reynolds, James Francis, to RCA Corporation. Amplifier using a negative resistance semiconductive device operative in the anomalous mode. 3,852,680, Cl. 330-34.000.
Rosen Enterprises, Inc., mesne: *See—*
Rosen, William E., 3,851,653.
Rosen, William E., to Rosen Enterprises, Inc., mesne. Method of puffing tobacco and reducing nicotine content thereof. 3,851,653, Cl. 131-140.00p.
Rosenberg, Harry: *See—*
Beulker, Franz; Becker, Kunibert; Rosenberg, Harry; Wieblitz, Hans-Dieter; and Kuti, Joseph, 3,851,480.
Rosenberg, Richard M., to Du Pont de Nemours, E. I., and Company. Photopolymerizable compositions containing organic nobel metal compounds. 3,852,074, Cl. 96-115.00p.
Rosenthal, Paul, to Calspan Corporation. Embrittlement machining method. 3,852,176, Cl. 204-129.460.
Roslivker, Efim Grigorievich: *See—*
Zhuravlev, German Alexandrovich; Roslivker, Efim Grigorievich; Chilevich, Eduard Mikhailovich; and Gurevich, Vladimir Samuilovich, 3,851,512.
Ross, Daniel Louis; and Barton, Lucian Anthony, to RCA Corporation. Electron beam recording process. 3,852,771, Cl. 346-74.00e.
Ross, Irving D., Jr.; and Madland, Thorvald. Vehicle transporting apparatus. 3,851,596, Cl. 105-368.00r.
Rossborg, Werner, to Alfa-Laval Bergedorfer Eisenwerke GmbH. Shuttle loom. 3,851,677, Cl. 139-125.000.
Rossi, Geremia: *See—*
Carignani, Milvio; Conti, Michele; Dufour-Berte, Casimiro; Rossi, Geremia; Pasero, Edoardo; and Zmolnig, Hermann, 3,851,827.
Roszewska, Irena: *See—*

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Rotenburg, Alexandr Aronovich: *See—*
Titov, Dmitry Vladimirovich; Rotenburg, Alexandr Aronovich; and Pevzner, Leonid Mikhailovich, 3,851,679.

Roth, Oskar, to Involvo AG. Dispensing device having lost motion piston pump. 3,851,801, Cl. 222-146.0he.

Rothbuhr, Lothar; and Fritz, Walter, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of carbon black beads. 3,852,399, Cl. 264-117.000.

Rothman, Leonard A.: *See—*
Baum, Arthur A.; and Rothman, Leonard A., 3,852,288.

Rowe, Richard G.: *See—*
Cofield, Eugene P., Jr.; and Rowe, Richard G., 3,851,619.

Roy, Albert G.: *See—*
Heintzelman, Leo; and Roy, Albert G., 3,852,377.

Roy, Rob: *See—*
Lowenschuss, Oscar; and Roy, Rob, 3,852,746.

Roybal, Frank V. Construction robot. 3,851,854, Cl. 254-7.00c.

Royston, James Allen: *See—*
Russell, Harold D.; Stone, Gerald; Lin, James; Hamilton, William F.; and Royston, James Allen, 3,852,789.

Rubenstein, Kenneth E.; and Ullman, Edwin F., to Syva Corporation. Compounds for enzyme amplification assay. 3,852,157, Cl. 195-63.000.

Rubin, Leon, to Atlantic Corporation. Process for preparing shrimp. 3,852,505, Cl. 426-370.000.

Rubin, Randolph D. Easel illumination monitoring method. 3,851,967, Cl. 355-77.000.

Rucker Company, The: *See—*
Piazza, Andre L.; and Vujasinovic, Ado N., 3,851,897.

Rudd, Kenneth Norman. Premium allocation device. 3,852,576, Cl. 235-92.0ga.

Rudi, Fred: *See—*
Aarflot, Aksel Ola; Rudi, Fred; Sorensen, Gunnar Birger; Alvsaker, Bjarne; and Berg, Otto, 3,852,122.

Rudin, Melvin: *See—*
Correll, Quentin E.; Swain, Allan L.; Oudijk, Tommy A.; Chamness, Leland D.; and Rudin, Melvin, 3,851,580.

Rudzki, Eugene M.: *See—*
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Ruekberg, Herbert S.: *See—*
Peyser, Harry A.; and Ruekberg, Herbert S., 3,851,806.

Ruescher, Markus: *See—*
Krueckels, Walter; and Ruescher, Markus, 3,851,832.

Rumyantsev, Vladimir Georgievich: *See—*
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Kolesikova, Nina Ivnovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,852,431.

Rupert, Donald N., Jr., to Dole Refrigerating Company. AC-DC plate refrigeration air system. 3,851,496, Cl. 62-406.000.

Rusakova, Nina Trofimovna: *See—*
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Kolesikova, Nina Ivnovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,852,431.

Rush-Hampton, Inc.: *See—*
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Russell, David B.: *See—*
Ribich, William A.; and Russell, David B., 3,851,357.

Russell, Harold D.; Stone, Gerald; Lin, James; Hamilton, William F.; and Royston, James Allen, to Log Etronics Inc. Rapid access graphic arts film processor. 3,852,789, Cl. 354-339.000.

Rutledge, Heath A.; Smith, Myron A.; and Spremulli, Paul F., to Corning Glass Works. Electrical furnace for melting thermoplastic material. 3,852,509, Cl. 13-6.000.

Rutz, Walter. Tool for removing threaded closures. 3,851,548, Cl. 81-3.430.

Ryan, John W.: *See—*
Grasko, Stephen Charles, 3,852,076.

Ryan, Robert E.: *See—*
Ryder, Robert C.; Ryan, Robert E.; and Klapproth, William J., Jr., 3,852,308.

Ryder, Robert C.; Ryan, Robert E.; and Klapproth, William J., Jr., to Koppers Company, Inc. Process for the production of phthalic anhydride. 3,852,308, Cl. 260-346.400.

Ryska, Josef: *See—*
Lojek, Rudolf; Ryska, Josef; and Cechach, Frydlant V., 3,851,408.

S&C Electric Company: *See—*
Rogers, Edward J.; and Evans, David, 3,852,542.

S.A. Staar: *See—*
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Sabella, Andrew: *See—*
Lingenfelter, Robert C.; and Sabella, Andrew, 3,852,553.

Sackin, Milton; and Edison, David M., to Westinghouse Electric Corporation. Elevator system. 3,851,733, Cl. 187-29.00r.

Sackin, Milton, to Westinghouse Electric Corporation. Elevator system. 3,851,734, Cl. 187-29.00r.

Sadashige, Koichi, to RCA Corporation. Color amplitude correction in plural transducer signal playback systems. 3,852,808, Cl. 358-8.000.

Safe Flight Instrument Corporation: *See—*
Greene, Leonard M., 3,852,711.
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Sagami Chemical Research Center: *See—*
Fujisawa, Tamotsu; and Aiba, Michio, 3,852,395.

Saint-Gobain Industries: *See—*
Baum, Hans; Reinicke, Ralf; and John Dieter, 3,851,581.
Baum, Hans; Reinicke, Ralf; and John, Dieter, 3,852,564.
Kuife, Siegfried; Karla, Heinz; and Frings, Gerd, 3,851,368.
Serret, Gerard, 3,851,975.

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Takemura, Satoshi; Harakon, Katsuyuki; Maeda, Mitsuaki; Sakai, Noboru; and Hamano, Etsuko, 3,851,693.

Sakakibara, Naoji, to Aisin Seiki Kabushiki Kaisha. Switching mechanism associated with governor mechanism. 3,852,545, Cl. 200-80.00r.

Sakurai, Yasuhiko, to Nippondenso Co., Ltd. Breakage detector for automotive lamp circuits. 3,852,733, Cl. 340-251.000.

San/Bar Corporation: *See—*
Vincent, Ogden W., 3,852,537.

Sanders Associates, Inc.: *See—*
McCarthy, Brian D., 3,852,640.

Sanders, James Milton: *See—*
Hall, John B.; and Sanders, James Milton, 3,852,358.

Sandlin, Charles Morris, to National Safe Corporation. Transfer station assembly. 3,851,843, Cl. 243-19.000.

Sandor, Bela, to General Motors Corporation. Telescopic counterbalance. 3,851,907, Cl. 292-262.000.

Sandoz, Inc.: *See—*
Schmutz, Jean; and Hunziker, Fritz, 3,852,446.

Sandoz Ltd.: *See—*
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Steinemann, Willy, 3,852,261.

Sandoz-Wander, Inc.: *See—*
Anderson, Paul L., 3,852,448.
Bacso, Imre; and Cooke, George A., 3,852,312.
Houlihan, William J., 3,852,303.

Sano, Takao; Fukuda, Katsuhiro; Ando, Akio; and Tameno, Louzou, to Tory Industries, Inc. Yarn twisting apparatus. 3,851,448, Cl. 57-75.000.

Sans, Inc.: *See—*
Sarns, Richard N., 3,851,646.

Santangelo, John A.: *See—*
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Santora, Norman Julian: *See—*
Diamond, Julius; and Santora, Norman Julian, 3,852,323.

Sarns, Richard N., to Sans, Inc. Connector for open heart surgery. 3,851,646, Cl. 128-214.00r.

Sasaki, Kenichi: *See—*
Hisatomi, Takashi; and Sasaki, Kenichi, 3,852,391.

Sato, Iwao: *See—*
Nagano, Yuji; and Sato, Iwao, 3,852,476.

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Saueressig G.m.b.H.: *See—*
Saueressig, Johann Heinrich; Konen, Josef; and Metges, Paul, 3,851,582.

Saueressig, Johann Heinrich; Konen, Josef; and Metges, Paul, to Saueressig G.m.b.H. Print machine for use with high solvent inks. 3,851,582, Cl. 101-181.000.

Savage Laboratories, Inc.: *See—*
Boros, Leslie; and Loftin, Diana, 3,852,459.

Savage, W. J., Co., Inc.: *See—*
Damewood, Marvin L., 3,851,869.

Savich, Peter P., to Scott Paper Company. Method of forming fibrous pads. 3,851,356, Cl. 19-144.500.

Savin Business Machines Corporation: *See—*
Smith, Ian Edward; Hastwell, Peter John; and Vermeulen, Marinus Cornelus, 3,851,964.

Savin Business Machines Corporation, mesne: *See—*
Van Vloten, Curtis P., 3,851,962.

Sawada, Kingo; Mizuno, Masaaki; and Ogihara, Masayoshi, to Toyoda Koki Kabushiki Kaisha. Grooving machine tool. 3,851,992, Cl. 408-54.000.

Sawer, Kermit L.: *See—*
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Scacciaferro, Frank: *See—*
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Scanner, Inc.: *See—*
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Scans Associates, Inc.: *See—*
Converse, Vernon G., III; and Lizzio, Angelo A., 3,851,523.

Schade, Otto Heinrich, Jr., to RCA Corporation. Current mirror amplifiers. 3,852,679, Cl. 330-30.00d.
Schafft, Hugo Willy, to Motorola, Inc. Acoustic horn. 3,852,529, Cl. 179-1.0mg.
Schalles, Erhard, to Werkzeugmaschinenfabrik Gildemeister & Comp. Aktiengesellschaft. Adaptive control system for program-operated machine tools. 3,851,550, Cl. 82-2.00b.
Scharpf, William G., to FMC Corporation. Chlorination of acetoacetamides. 3,852,351, Cl. 260-562.00b.
Schauer, Alois: *See—*
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Schiffarth, Josef: *See—*
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Schilling, Paul K., to Plastics, Inc. Tray having an extruded edge. 3,851,808, Cl. 224-48.00r.
Schimpf, Franz-Wilhelm; and Rinke, Wilfried, to Aktiengesellschaft fur Brauerei-Industrie. Preparation of a low alcohol dietary beer. 3,852,495, Cl. 426-14.000.
Schlegel Manufacturing Company: *See—*
Fine, Harry Harold, 3,851,443.
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Tibbetts, Philip E., 3,851,420.
Schlinger, Warren G.; Kaufman, Harold C.; and Crawley, Carroll L., said Schlinger and said Kaufman assors. to Texaco Inc. Manufacture of petroleum coke. 3,852,047, Cl. 44-24.000.
Schlitt, Charles D.; and Federspiel, Douglas M. Self-adjusting, self-tightening multipurpose wrench. 3,851,549, Cl. 81-106.000.
Schluter, Bernard C.; and Tromborg, Erik T., to Honeywell Inc. Gas monitoring system. 3,851,520, Cl. 73-23.000.
Schmalzriedt, Fritz: *See—*
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Schmidt, Karl; and Neubert, Gerhard, to Dr. Beck & Co. GmbH. Polyesterimide resins. 3,852,246, Cl. 250-75.00n.
Schmidt, Robert R.: *See—*
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Schmitt, Donald E.: *See—*
Clay, Howard W.; and Schmitt, Donald E., 3,851,942.
Schmitt, Donald J.; and Anderson, Richard M., to Thermo-O-Disc Incorporated. Dual temperature thermosat. 3,852,698, Cl. 337-354.000.
Schmitt, John M.; Crouse, David J., Jr.; and Howerton, William B., to United States of America, Atomic Energy Commission. Method for removing alkyl iodides from air by mercuric nitrate solution. 3,852,407, Cl. 423-240.000.
Schmutz, Jean; and Hunziker, Fritz, to Sandoz, Inc. Organic compounds in the treatment of psychotic disturbances. 3,852,446, Cl. 424-250.000.
Schneider, Felix: *See—*
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Schneider, Kurt A.; Adams, Leonard H.; and Hilpert, Conrad R., to Twin Disc, Incorporated. Hoist reversing transmission with centrifugal speed control. 3,851,739, Cl. 192-3.570.
Schnell, Albert C.; Arends, Craig W.; and Zwikel, Dean N., to Continental Can Company, Inc. Noise reduction kit for can closing machine. 3,851,725, Cl. 181-33.00k.
Schnettler, Richard A.: *See—*
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Schoepfle, Blaine O.: *See—*
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Schofield, Arthur T., to Manufacturers Brush Company, The. Interlocking rotary brush construction. 3,851,350, Cl. 15-181.000.
Schorwerth, Mathias: *See—*
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Schreiber, William Lewis; Vock, Manfred; Shuster, Edward Joseph; and Pittet, Alan O., to International Flavors & Fragrances Inc. Process of altering the flavor of a tomato soup mix with 2-phenyl-4-pentenal. 3,852,482, Cl. 426-65.000.
Schubert, John C.: *See—*
Case, Charles B.; Hebert, David M.; Olson, Maylin J.; and Schubert, John C., 3,851,789.
Schuh, Frank R. Packaging machine. 3,851,445, Cl. 53-329.000.
Schulein, Joseph: *See—*
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Schulein, Margaret A.: *See—*
De Lyria, Karl G., 3,852,718.
Schuler, Manfred. Divers weight. 3,851,488, Cl. 61-70.000.
Schulke, Karl A., to Heraeus-Schott Quarzschmelze GmbH. Ampoule construction. 3,851,785, Cl. 220-2.200.
Schultz, Frederick A.: *See—*
Barbeau, Raymond A.; McGinnis, Bernard W.; and Schultz, Frederick A., 3,852,820.
Schuocker, Dieter; and Lippmann, Hans Joachim, to Siemens Aktiengesellschaft. Vacuum switch. 3,852,555, Cl. 200-144.00b.
Schurch, Eugen, to Von Roll AG. Transport system for goods carriers. 3,851,778, Cl. 214-622.000.
Schuster, Wilhelm. Resilient supporting member. 3,851,430, Cl. 52-108.000.
Schwab, Louis, S.A.: *See—*
Schwab, Samuel, 3,851,458.
Schwab, Samuel, to Schwab, Louis, S.A. Electrical alarm device for an alarm clock. 3,851,458, Cl. 58-20.000.
Schwalm, Walter A. Magnetic convergence device for cathode ray tubes. 3,852,693, Cl. 335-212.000.
Schwarcz, Andor, to Nashua Corporation, mesne. Pressure-sensitive adhesive tapes including a polycarbamate release coating. 3,851,761, Cl. 206-411.000.
Schwartz, Leonard: *See—*
Henf, George; and Schwartz, Leonard, 3,852,762.
Schwartz, Robert J., to Texas Instruments, Incorporated. Surface wave clock and serial data storage unit. 3,852,724, Cl. 340-173.0rc.
Schwarz, Meyer; Sonnet, Philip E.; and Wakabayashi, Nobel, to United States of America, Agriculture. Arthropod maturation inhibitors. 3,852,310, Cl. 260-348.00r.
Schwarz, Rudolf, to Staubli Ltd. Positive dobby. 3,851,675, Cl. 139-71.000.
Schwarzler, Peter; and Walkner, Christian, to Krauss-Maffei Aktiengesellschaft. Electromagnetic suspension and guide system for suspended vehicles adapted to switch tracks. 3,851,594, Cl. 104-148.0ms.
Schweiger, Erwin: *See—*
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Schweizer, Christian: *See—*
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Scripto, Inc.: *See—*
Cofield, Eugene P., Jr.; and Rowe, Richard G., 3,851,619.
Sculati, Marvin Americo; and Gaynor, John Cornelius, to Uniroyal, Inc. Apparatus for molding rubber. 3,852,005, Cl. 425-119.000.
Scurlock, John T. Inflatable safety cushion system for controlled deceleration from falls of great height. 3,851,730, Cl. 182-137.000.
Seaman, Jack L., to General Motors Corporation. Part throttle adjustment. 3,852,383, Cl. 261-69.00r.
Seaman, Russell L.: *See—*
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Searle, G. D., & Co.: *See—*
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Seascope Services, Inc.: *See—*
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Seidler, Helmut G.; and Walker, James T., to Philco-Ford Corporation. Printed wiring circuit guard ring. 3,852,644, Cl. 317-101.00c.
Seifert, Edwin A., Jr. Device for metering granular material. 3,851,604, Cl. 111-77.000.
Seiko Koki Kabushiki Kaisha: *See—*
Ogihara, Masuo; and Yonemoto, Tomoo, 3,852,785.
Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, 3,852,786.
Seippel, Claude, to BBC Brown Boveri & Company Limited. Blading for axial flow turbo-machine. 3,851,994, Cl. 416-223.000.
Seki, Hideki; Furuya, Sachinori; and Hiroyasu, Mamoru, to Matsushita Electric Industrial Co., Ltd. Printed circuit board assembly and heat sink. 3,852,643, Cl. 317-100.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
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Senning, Alexander; Buchholt, Hans Christian; Bierling, Robert; Steinhoff, Dieter; and Trossmann, Gerhard, to Farbenfabriken Bayer Aktiengesellschaft. Pharmaceutical compositions containing sulfonate derivatives of 1,4-bis(propionyl) piperazine. 3,852,447,Cl. 424-250.000.

Sentak, John A.: *See*—
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Serret, Gerard, to Saint-Gobain Industries. Optical method and apparatus for detection of defects. 3,851,975, Cl. 356-198.000.

Settineri, William J.; and Wessling, Ritchie A., to Dow Chemical Company, The. Hydrophobic coatings and synthesis by electrochemical reduction of sulfonium compounds. 3,852,174, Cl. 204-73.00r.

Setzer, William C.; Cheskis, Harvey P.; and Winter, Joseph, to Swiss Aluminium Ltd., mesne. Aluminum alloy can end and body. 3,851,787, Cl. 220-273.000.

Severson, Howard B.: *See*—
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Shade, Michael J.: *See*—
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Shapiro, Harry. Vertical louver type window drape. 3,851,699, Cl. 160-166.000.

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Robinson, Joseph D., 3,852,593.
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Shen, Michael T. Single stage power amplifiers for multiple signal channels. 3,852,530, Cl. 179-1.0gq.

Shepard, David. Apparatus for etch resist coating of plated holes in printed circuit boards. 3,851,621, Cl. 118-102.000.

Shepley, Alma H.: *See*—
Shepley, John H.; Eberly, Harry C.; Luek, Otto W.; and McIlwain, Irwin D., 3,851,904.

Shepley, John H.; deceased (by Shepley, Alma H.; executrix); Eberly, Harry C.; Luek, Otto W.; and McIlwain, Irwin D. Baler twine strand guide assembly. 3,851,904, Cl. 289-15.000.

Sherman, Warren S.; and Verdouw, Albert J., to General Motors Corporation. Recirculating combustion apparatus jet pump. 3,851,467, Cl. 60-39.650.

Shichman, Daniel, to Uniroyal, Inc. Apparatus for cooling tires during post-inflation. 3,852,008, Cl. 425-28.00p.

Shih, Kelvin, to General Motors Corporation. Fuel system for an internal combustion engine. 3,851,633, Cl. 123-127.000.

Shimizu, Hirokatsu: *See*—
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Shinetsu Chemical Company: *See*—
Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, 3,852,421.

Shinjo, Katsumi. Method and apparatus for attachment of a nut in the inside wall of a pipe. 3,851,373, Cl. 29-432.200.

Shirley, Billie J. Sand dumping tool for down hole deposition of sand in oil and gas wells. 3,851,703, Cl. 166-169.000.

Shirota, Kohei: *See*—
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Shishido, Toshimasa; and Atsumi, Minoru, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor. 3,852,379, Cl. 261-23.00a.

Shkurovich, Yakov Solomonovich: *See*—
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Shlachter, Bernard: *See*—
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Shuart, Barry L. Building panel connection means and method. 3,851,428, Cl. 52-285.000.

Shuman, Dennis A.: *See*—
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Shuster, Edward Joseph: *See*—
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Sicking, Heinrich; and Rittberg, Eilt-Heyo, to Olympia Werke AG. Ink ejection printing devices. 3,852,773, Cl. 346-140.000.

Siddall, John B.: *See*—
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Siegel, Edgar, to Bayer Aktiengesellschaft. Substituted 4-(N-sulphoalkylene-aminosulphonyl)-phenyl-azo-phenyl compounds. 3,852,263, Cl. 260-205.000.

Siekman, Jakob Gerard: *See*—
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Siemens Aktiengesellschaft: *See*—
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Fracke, Aribert; Klein, Heinrich; Pieper, Rudolf; Weber, Eduard; and Wachtler, Hans, 3,851,404.
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Sieniawski, Bohdan, to Zaklady Urzadzen Okretowych "Hydroster". Gyrating-cam engine, particulary as a hydraulic engine. 3,852,002, Cl. 418-61.00r.

Sieurin, Donald, to Morgan Construction Company. Shearing apparatus. 3,851,556, Cl. 83-311.000.

Signetics Corporation: *See*—
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Signode Corporation: *See*—
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Young, Hobart P.; and Noren, Donald W., 3,851,759.

Sills, Cecil M. Mechanical pipe couplings. 3,851,901, Cl. 285-112.090.

Silver, David A.: *See*—
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Silverman, Sydney H. Method for controlling psoriasis. 3,852,456, Cl. 424-267.000.

Silvestri, Luigi; and Arioli, Vittorio, to Gruppo Lepetit S.p.A. Antibacterial compositions containing rifampicin and a pyrimidine derivative. 3,852,450, Cl. 424-251.000.

Simmons, Todd S.; Trinks, Rudolph H.; and Vit, Jaroslav, to National Patent Development Corporation. Organic solvent soluble metal aluminates. 3,852,309, Cl. 260-347.700.

Simon, Heinz. Cigarette box. 3,851,506, Cl. 70-271.000.

Simons, Charles W.; and Holdsworth, Robert S., to Grace, W. R., & Co. Anesthetic trifluoromethylcyclobutanes. 3,852,474, Cl. 424-352.000.

Sinenko, Mikhail Grigorievich: *See*—
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Kolesikova, Nina Ivnovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,852,431.

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Siskin, Michael; and Porcelli, Joseph J., to Exxon Research and Engineering Company. Isomerization of reformer feed using a metal halide/hydrogen halide catalyst. 3,852,184, Cl. 208-64.000.

Sitter, Matthew M.; Meyers, Robert M.; and Kutch, Edward F., to Novagard Corporation. Insulating glass window assemblies. 3,852,149, Cl. 161-45.000.

Sjovall, Jan: *See*—
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Skelcey, James S.; Richards, David W.; and Hart, Alan M., to Dow Chemical Company, The. Cereal products containing magnesium compounds as nutritional supplements. 3,852,497, Cl. 426-74.000.

SKF Industrial Trading and Development Company B.V.: *See*—
Gregory, Derek P., 3,852,180.
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Skogsholm, Einar A.; and Tracy, John G., to General Electric Company. Commutation control for inverter circuit. 3,852,657, Cl. 321-18.000.

SKOMAB International Maschinen und Stahl Handelsgesellschaft m. b. H.: *See*—
Spengler, Ernst M., 3,851,518.

Slagle, Edward, to Picker Corporation. Method and apparatus for repidly immobilizing a patient. 3,851,644, Cl. 128-134.000.

Slam, Thomas J.: *See*—
Wilson, Farris H., Jr.; and Slam, Thomas J., 3,852,350.

Slater, Grant G. Layering cone. 3,852,195, Cl. 210-94.000.

Slater, Robert, to Singer Company, The. Single time shared receiver and frequency tracker for a beam-lobed doppler radar system. 3,852,744, Cl. 343-9.000.

Slavik, William H.: *See*—
Marik, Charles J.; Shlachter, Bernard; and Slavik, William H., 3,852,624.

Smalley, Edmund Walter: *See*—
Bruen, Charles Patrick; Low, William Wayne; and Smalley, Edmund Walter, 3,852,059.

Smith, Bob L. Phased array antenna with phase shifter cooling. 3,852,764, Cl. 343-778.000.

Smith, Charles L.: *See*—
Webster, William C.; and Smith, Charles L., 3,852,084.

Smith, Claude A.: *See*—
Kepple, Richard K.; and Smith, Claude A., 3,851,546.

Smith, Ernest L., to Phillips Petroleum Company. Generally frustoconical container and blank therefor. 3,851,813, Cl. 229-17.00g.
Smith, Harry A., to Dow Chemical Company, The. Rapid setting formaldehyde epoxy resin compositions. 3,852,240, Cl. 260-47.0ep.
Smith, Ian Edward; Hastwell, Peter John; and Vermeulen, Marinus Cornelus, to Savin Business Machines Corporation. Contact transfer electrostatic copying apparatus. 3,851,964, Cl. 355-10.000.
Smith Kline & French Laboratories: *See—*
Baile, Clifton A.; Gallagher, Gregory; McLaughlin, Carol L.; and Webb, Robert Lee, 3,852,473.
Smith, Larry Charles. Pitcher. 3,851,860, Cl. 259-55.000.
Smith, Leslie Harold: *See—*
Howe, Ralph; and Smith, Leslie Harold, 3,852,468.
Smith, Lester C.; Ziffer, Garret F.; and Nelson, John Russell, to Coulter Electronics Inc., mesne. Automatic method and system for analysis and review of a plurality of stored slides. 3,851,972, Cl. 356-72.000.
Smith, Lucille G.: *See—*
Smith, Theodore M., 3,851,890.
Smith, Myron A.: *See—*
Rutledge, Heath A.; Smith, Myron A.; and Spremulli, Paul F., 3,852,509.
Smith, Roy E., to Packard Instrument Company, Inc. Vial transfer mechanism. 3,852,599, Cl. 250-328.000.
Smith, Ruford Bryan. Roll of plastic film aprons. 3,851,760, Cl. 242-55.530.
Smith, Theodore F. Subway board game apparatus. 3,851,881, Cl. 273-134.0ac.
Smith, Theodore M., to Smith, Theodore M., Trust, Smith, Lucille G. and Smith, Theodore M., trustees. Quick change spindle adapter and nut assembly. 3,851,890, Cl. 279-75.000.
Smith, Theodore M., Trust: *See—*
Smith, Theodore M., 3,851,890.
Smith, Theodore M., trustees: *See—*
Smith, Theodore M., 3,851,890.
Smith, Traner J.: *See—*
Lazzarini, Louis P.; and Smith, Traner J., 3,851,753.
Smithkline Corporation: *See—*
Weinstock, Joseph, 3,852,462.
Snell, George J.: *See—*
Sze, Morgan C.; and Snell, George J., 3,852,182.
Snell, George J., to Lummus Company, The. Coal liquefaction. 3,852,183, Cl. 208-10.000.
Snider, Harold F., to Therm-O-Disc Incorporated. Bimetal snap disc. 3,852,697, Cl. 337-348.000.
Societe Anonyme Automobiles Citroen: *See—*
Grosseau, Albert, 3,851,722.
Grosseau, Albert, 3,851,912.
Grosseau, Albert, 3,851,929.
Societe Anonyme Poclain: *See—*
Leyrat, Pierre J. E., 3,851,776.
Societe Anonyme: Seperef-TMP Societe pour l'Equipment des Reseaux en Canalisations de Matieres Plastiques: *See—*
Delauzun, Robert, 3,852,016.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Farr, David Robert, 3,852,478.
Societe de Fabrication et de Distribution de Parfumerie et Cosmetique Diparco S.A.: *See—*
Paoletti, Jean-Claude, 3,851,799.
Societe Emballages Monles: *See—*
Pillon, Marcel Octave, 3,851,439.
Societe Francaise des Produits Pour Catalyse: *See—*
Duhaut, Pierre; and Miquel, Jean, 3,852,215.
Societe Industrielle d'Electronique et d'Informatique: *See—*
Murtin, Fernand R. C.; Mercier, Loic; and Barat, Jean, 3,851,635.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Camboulives, Andre Alphonse Mederic Leon; Le Maout, Theophile Francois; Marchi, Marc Roger; and Vandenbroucke, Roger Alfred Jules, 3,851,900.
Sodec/Saia: *See—*
Nicoud, Jean-Daniel, 3,852,572.
Soehring, Gerhard: *See—*
Kreutze, Gerhard; Moessner, Manfred; Obstfelder, Guenther; Soehring, Gerhard; and Pfirrman, Victor, 3,851,959.
Sofer, George A.: *See—*
Carlson, Roy C.; King, Loyd L.; and Sofer, George A., 3,852,154.
Sohn, Fred; Hunter, Larry C.; and Holmes, James Frederick, to Sun Studs, Inc. Method and apparatus for determining the surface configuration of elongate objects, particularly logs. 3,852,579, Cl. 235-151.300.
Sola Basic Industries, Inc.: *See—*
Vander Ploog, Cornelius J.; Henry, Arnold W.; and Connolly, Franklin J., 3,852,516.
Sommer, G. M., Co., Inc.: *See—*
Sommer, Gordon M.; Williams, Alfred C.; and Carlson, Donald C., 3,851,742.
Sommer, Gordon M.; Williams, Alfred C.; and Carlson, Donald C., to Sommer, G. M., Co., Inc. Control system for variable speed drive. 3,851,742, Cl. 192-103.00f.
Sonnet, Philip E.: *See—*
Schwarz, Meyer; Sonnet, Philip E.; and Wakabayashi, Nobel, 3,852,310.
Sonoyama, Yuzo: *See—*
Furukawa, Shogi; Sonoyama, Yuzo; and Ohi, Akira, 3,852,393.
Sony Corporation: *See—*
Hongu, Masayuki; and Ikeda, Isamu, 3,852,676.
Morii, Kokichi, 3,852,686.
Takeda, Masashi, 3,852,688.
Sorensen, Gunnar Birger: *See—*
Aarflot, Aksel Ola; Rudi, Fred; Sorensen, Gunnar Birger; Alvsaker, Bjarne; and Berg, Otto, 3,852,122.
Souers, George, to United States Steel Corporation. Gas venting in the manufacture of chilled rolls. 3,851,701, Cl. 164-127.000.
Souillard, Georges Jules Pierre; and Van Quaethoven, Frederic Francois Paul, to Cosden Oil and Chemical Company. Lubricant compositions. 3,852,204, Cl. 252-33.400.
Southern, Edward M.: *See—*
Kirton, Kenneth T.; and Southern, Edward M., 3,852,465.
Sp.A. Luigi Rizzi & C.: *See—*
Repetto, Silvio, 3,851,423.
Spangenberg, William C.: *See—*
Nordyke, John S.; and Spangenberg, William C., 3,852,087.
Spectra-Strip Corporation: *See—*
Lang, Roger J., 3,851,425.
Spengler, Ernst M., to SKOMAB International Maschinen und Stahl Handelsgesellschaft m. b. H. Bending apparatus for bending strip steel knives. 3,851,518, Cl. 72-384.000.
Sperber, Heinrich: *See—*
Haas, Hans; Sperber, Heinrich; and Friedrichsen, Wilhelm, 3,852,361.
Sperry Rand Corporation: *See—*
Jacobson, Peter E., 3,851,933.
Macek, Warren M., 3,851,973.
Spisak, Andrew J.; and Dillman, Thayer L., to Westinghouse Electric Corporation. Rectifier assembly for brushless excitation systems. 3,852,628, Cl. 310-68.00d.
Spitzl, Walter: *See—*
Meisner, Alfred; and Spitzl, Walter, 3,851,385.
Sprang, Richard W.: *See—*
Flinner, Vaughn D.; Sprang, Richard W.; Zody, Dana D.; and Fulton, Howard A., 3,851,339.
Sprauer, Jerome William, to Du Pont de Nemours, E. I., and Company. Melt-condensed polyamide interpolymers. 3,852,226, Cl. 260-18.00n.
Sprecher, Raymond G., to General Motors Corporation. Vehicle occupant restraint belt retractor. 3,851,836, Cl. 242-107.700.
Spremulli, Paul F.: *See—*
Rutledge, Heath A.; Smith, Myron A.; and Spremulli, Paul F., 3,852,509.
Spriggs, Dennis Mitchel: *See—*
Jet, Marion Barney; and Spriggs, Dennis Mitchel, 3,851,705.
Square D Company: *See—*
Jorgensen, George N.; and Wartner, Frank J., 3,852,515.
Squibb, E. R., & Sons, Inc.: *See—*
Dolfini, Joseph E., 3,852,282.
Dolfini, Joseph Edward; and Erickson, Raymond Curry, 3,852,283.
Haugwitz, Rudiger D.; and Narayanan, Venkatachala L., 3,852,301.
Krapcho, John; and Turk, Chester Frank, 3,852,279.
Krapcho, John, 3,852,339.
Krapcho, John, 3,852,347.
Squier, William H.; and Poteat, William E., to Lowenstein, M., & Sons, Inc. Contoured article with three dimensional surface thereon. 3,852,146, Cl. 161-19.000.
St. Pierre, Henri J. Connector. 3,851,894, Cl. 280-460.00r.
Staar, Theophiel Clement Jozef Lodewijk, to S.A. Staar. Automatic changer for cassette player-recorder. 3,852,819, Cl. 360-92.000.
Stacey, Eric J.: *See—*
Gyugyi, Laszlo; and Stacey, Eric J., 3,852,654.
Stach, Hans: *See—*
Krauss, Hans Ludwig; and Stach, Hans, 3,852,406.
Stach, Leonard J.: *See—*
Richter, Sidney B.; and Stach, Leonard J., 3,852,345.
Stachowiak, Aribert: *See—*
Franz, Karl; Christgau, Hermann; and Stachowiak, Aribert, 3,852,632.
Stackpole Carbon Company: *See—*
Quirk, Virgil P., 3,852,566.
Stage, Leo J., to Arvey Corporation. Gusseted article. 3,851,814, Cl. 229-53.000.
Stahl, Andre: *See—*
Alais, Michel; and Stahl, Andre, 3,851,381.
Stahl, William F., to Westinghouse Electric Corporation. Pivoted pad bearings. 3,851,935, Cl. 308-73.000.
Stamicarbon N.V.: *See—*
De Rooij, Abraham H., 3,852,273.
De Rooij, Abraham Hermanus, 3,852,272.
Stancio, Doina Ecaterina G.: *See—*
Dumitru, Ion D.; Grigoras, Victor A.; Turtureanu, Mircea Ioan T.; Stancio, Doina Ecaterina G.; and Anescu, Vasile V., 3,851,406.
Standard Car Truck Company: *See—*
Clasen, Claus J. Werner, 3,851,595.
Standard Oil Company: *See—*
Case, Charles B.; Hebert, David M.; Olson, Maylin J.; and Schubert, John C., 3,851,789.
Stephens, James R., 3,852,248.
Standing, David Talbot: *See—*
Hibberd, Barry Reginald; and Standing, David Talbot, 3,851,352.

Stanford Research Institute: *See*—
Aberth, William H., 3,852,595.

Stangeland, Bruce E.; and Egan, Clark J., to Chevron Research Company. Production of stable lubricating oils by sequential hydrocracking and hydrogenation. 3,852,207, Cl. 208-58.000.

Stanley, Russell A., to Bobcock & Wilcox Company, The. Industrial technique. 3,851,603, Cl. 110-56.000.

Stanley Works, The: *See*—
Scoville, Andrew E.; and Davis, William R., 3,852,592.
West, Robert F., 3,851,990.

Stansbury, Patrick H., to ASC Industries, Inc. Belling and handling apparatus for plastic pipe. 3,852,015, Cl. 425-392.000.

Stapp, Hans: *See*—
Werner, Helmut; and Stapp, Hans, 3,852,152.

Stark, Louis, to Hughes Aircraft Company. High-resolution hemispherical reflector antenna. 3,852,748, Cl. 343-100.0am.

Statni vyzkumny ustav Kozedlyn: *See*—
Muck, Eduard; Strachota, Jaroslav; and Horak, Josef, 3,852,230.

Staubli Ltd.: *See*—
Schwarz, Rudolf, 3,851,675.

Stauffer Chemical Company: *See*—
Teach, Eugene G., 3,852,348.

Stazinger, Gerhard: *See*—
Hartenstein, Johannes Hermann; and Stazinger, Gerhard, 3,852,265.

Ste Automobiles Peugeot: *See*—
Piret, Jean; and Quemerais, Philippe, 3,851,547.

Stearn, Leathem S. Stream-stay. 3,851,608, Cl. 114-105.000.

Stearn, Leathem Smith. Two groove headstay. 3,851,609, Cl. 114-105.000.

Stebe, Robert F., to VRC California Inc. Concealed enclosure latch. 3,851,941, Cl. 312-333.000.

Steding, Jerry A. Method and apparatus for installing concrete piles. 3,851,484, Cl. 61-53.520.

Steding, Jerry A. Method and apparatus for installing concrete piles. 3,851,485, Cl. 61-53.520.

Stein, Emanuel: *See*—
Bresler, Aaron D.; Stein, Emanuel; and Erdmann, M. Otto, 3,852,765.

Stein, Herman Hal: *See*—
Prasad, Raj Nandan; and Stein, Herman Hal, 3,852,268.

Steinemann, Willy, to Sandoz Ltd. 5-Arylazo-6-hydroxypyridone-2 dyes bearing a cationic group in the 3-position. 3,852,261, Cl. 260-156.000.

Steiner, Edward L.: *See*—
Reehil, Edward G.; and Steiner, Edward L., 3,851,966.

Steiner, John E.; and Volk, Donald N., to United States Steel Corporation. Method and apparatus for wrapping wire about a conduit. 3,851,831, Cl. 242-7.220.

Steinhoff, Dieter: *See*—
Senning, Alexander; Buchholt, Hans Christian; Bierling, Robert; Steinhoff, Dieter; and Trossmann, Gerhard, 3,852,447.

Steinle, Paul P.; and Steinle, Paul R. Bingo card with pivoted masking tabs. 3,851,882, Cl. 273-136.00f.

Steinle, Paul R.: *See*—
Steinle, Paul P.; and Steinle, Paul R., 3,851,882.

Steinmetz, Carl Charles: *See*—
Gange, Robert Allen; Nagle, Eugene Michael; and Steinmetz, Carl Charles, 3,851,948.

Stendel, Wilhelm: *See*—
Wollweber, Hartmund; Enders, Edgar; and Stendel, Wilhelm, 3,852,304.

Stepe, Visvaldis A., to Caterpillar Tractor Company. Replaceable cutting edge. 3,851,711, Cl. 172-681.000.

Stephens, James R., to Standard Oil Company. Film forming polyamide composition containing fumaric acid and trimellitic acid residues. 3,852,248, Cl. 260-78.0tf.

Stephenson, Charles V.: *See*—
Roberts, Victor B.; Stephenson, Charles V.; and Good, Robert E., Jr., 3,852,713.

Stewart, David S., to Zenith Radio Corporation. Carriage assembly for a video disc playback deck. 3,852,816, Cl. 360-86.000.

Stewart, Edward F., to International Telephone and Telegraph Corporation. Tone detection and switching circuit. 3,852,675, Cl. 328-138.000.

Stewart, Vernon G.: *See*—
Visser, Ronald C.; and Stewart, Vernon G., 3,851,714.

Stewart-Warer Corporation: *See*—
Brouwer, Frans, 3,852,590.

Stober, Paul, to Gebr. Stober. Variable ratio friction transmission. 3,851,534, Cl. 74-193.000.

Stoke, Richard C., to Varian Associates. Dither tuned microwave tube. 3,852,638, Cl. 315-39.610.

Stone, Gerald: *See*—
Russell, Harold D.; Stone, Gerald; Lin, James; Hamilton, William F.; and Royston, James Allen, 3,852,789.

Stone, Thomas G., to Evans Products Company. Air bulkhead assembly. 3,851,597, Cl. 105-492.000.

Stoneham, Jeffrey Richard, to Eastman Kodak Company. Early metering failure prevention device. 3,852,784, Cl. 354-206.000.

Stork, Fritz, to Telefunken Patentverwertungsgesellschaft m.b.H. Method of producing a semiconductor or thick film device. 3,851,382, Cl. 29-578.000.

Story, Thomas A.; and Khuntia, Natabara, to General Motors Corporation. Master link for a crawler tractor. 3,851,932, Cl. 305-58.000.

Strachota, Jaroslav: *See*—
Muck, Eduard; Strachota, Jaroslav; and Horak, Josef, 3,852,230.

Stranahan, John Jacob; and Hollier, John Carroll Lee, to Texaco, Inc. High Capacity smokeless flare having a very low gas flow detector. 3,852,019, Cl. 431-4.000.

Strapex AG: *See*—
Glaus, Heinrich; and Jeanmaire, David, 3,851,683.

Streel, Dominique, to Cockerill-Ougrie-Providence et Esperance-Longdoz en Abregi. Continuous electronic heating device for metallic wire and sheet metal. 3,852,560, Cl. 219-121.0eb.

Stripling, William W.; White, Harold V.; and Hunter, Joe S., to United States of America, Army. Method of laying a ballistic missile. 3,851,844, Cl. 244-3.160.

Strojosvit, nardni podnik: *See*—
Miculka, Zdenek; Janirek, Vladislav; Rektorik, Vladimir; and Hanacek, Josef, 3,851,414.

Strong, Jerry G., to Mobil Oil Corporation. 2-Allyl-3-chloro-2-cyclohexen-1-ones and their preparation. 3,852,357, Cl. 260-586.00r.

Stroszynski, Joachim, to Hoechst Aktiengesellschaft. Apparatus for graining surfaces of planographic printing plates. 3,851,421, Cl. 51-11.000.

Strugar, Daniel: *See*—
Incremona, Joseph H.; and Strugar, Daniel, 3,852,106.

Stuart, William R., to Varian Associates. Offset stinger for arc lamp. 3,852,629, Cl. 313-152.000.

Stubben GmbH: *See*—
Bischeltsrieder, Lorenz, 3,851,446.

Suchkov, Vasily Georgievich: *See*—
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Kolesikova, Nina Ivnovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,852,431.

Sud-Chemie Aktiengesellschaft: *See*—
Lienau, Rainer; and Hofmann, Friedrich, 3,852,430.

Sugahara, Eisuke; Yagi, Yusaku; and Owada, Akihito, to Nippon Piston Ring Co., Ltd. Fluid actuated clutch assembly. 3,851,741, Cl. 192-85.00r.

Suggitt, Robert M.; Estes, John H.; and Kravitz, Stanley, to Texaco Inc. Isomerization with fluorided composite alumina catalysts. 3,852,372, Cl. 260-683.680.

Suh, John T.; and Schnettler, Richard A. 1-Benzyl-4-(alkylidene)-hexahydro-4H-azepines. 3,852,280, Cl. 260-240.00f.

Sullos, Ludwig. Switch device for point selector electrodes in flat television screens. 3,852,634, Cl. 313-422.000.

Sumitomo Chemical Company, Limited: *See*—
Nagase, Tsuneyuki; Suzukamo, Gohu; and Fukao, Masami, 3,852,305.
Usamoto, Teruyoshi; Hatada, Yasutaka; Furuichi, Itsuro; and Matsuo, Masao, 3,852,354.

Sump, Kenneth R.: *See*—
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Sun Studs, Inc.: *See*—
Sohn, Fred; Hunter, Larry C.; and Holmes, James Frederick, 3,852,579.

Sun Ventures, Inc.: *See*—
Turner, John O.; and Norton, Richard V., 3,852,349.

Sunami, Hideo: *See*—
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Sundquist, Donald J.: *See*—
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Sunjic, Vitomir: *See*—
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Sureau, Robert Frederick Michel: *See*—
Domergue, Annick Marthe Suzanne Simone; Mingasson, Georges Raymond Henry; and Sureau, Robert Frederick Michel, 3,852,275.

Surg, Earl H.: *See*—
Gallagher, John P.; Meyers, Robert M.; and Surg, Earl H., 3,852,214.

Suwada, Ataru: *See*—
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Suzukamo, Gohu: *See*—
Nagase, Tsuneyuki; Suzukamo, Gohu; and Fukao, Masami, 3,852,305.

Suzuki, Hiroshi; and Ichimaru, Tadashi, to Japan Exlan Company Limited. Method for producing artificial fibers containing microcapsules. 3,852,401, Cl. 264-182.000.

Suzuki, Masaru, said Suzuki assor. to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Direction indicator automatic return device. 3,852,543, Cl. 200-61.270.

Suzuki, Morio: *See*—
Kiyanagi, Tetsuo; Suzuki, Morio; and Yoshino, Hiroshi, 3,852,266.

Suzuki, Susumu: *See*—
Ishikawa, Narimasa; Suzuki, Susumu; Ougusa, Yasuhiro; and Arai, Koozo, 3,852,225.

Suzuki, Talao: *See*—

Kimura, Seiichi; Suzuki, Talao; and Nakajima, Masahiro, 3,852,699.

Svensson, Orvar Anders, to AGA Aktiebolag. Nozzle for plasma welding torch. 3,851,824, Cl. 239-132.300.

Swain, Allan L.: *See—*
Correll, Quentin E.; Swain, Allan L.; Oudijk, Tommy A.; Channess, Leland D.; and Rudin, Melvin, 3,851,580.

Swain, Stephen C., to Cambridge Research and Development Group. Plural chambered, gravity oriented dispenser. 3,851,800, Cl. 222-145.000.

Swanson, Frank D.: *See—*
Gregornik, Norman W.; and Swanson, Frank D., 3,852,245.

Swanson, Leopold G. Multiple adjustment shear. 3,851,389, Cl. 30-250.000.

Swenson, Richard E. Touring ski binding. 3,851,892, Cl. 280-11.35y.

Swenson Spreader and Mfg. Co.: *See—*
Fyrk, Clas O. F., 3,851,804.

Swietoslawski, Roman: *See—*
Jozwicki, Ryszard; Kubica, Henryk; Ankudowicz, Waclaw; Jedryka, Tadeusz; Roszewska, Irena; Kurzyniec, Stanislaw; Swietoslawski, Roman; and Olczyk, Franciszek, 3,851,455.

Swift & Company: *See—*
Findley, Thomas W.; and Benner, John F., 3,852,057.

Swiss Aluminium Ltd.: *See—*
Merz, Walter, 3,851,926.

Swiss Aluminium Ltd., mesne: *See—*
Setzer, William C.; Cheskis, Harvey P.; and Winter, Joseph, 3,851,787.

Swoager, Jon R., to Automation Equipment, Inc. Multi-purpose vehicle for use underground. 3,851,481, Cl. 61-45.00d.

Sybron Corporation: *See—*
Komiske, Frank Charles, 3,851,858.
Symonds, James Arthur; and Jaquith, Howard Randall, 3,851,530.

Symonds, James Arthur; and Jaquith, Howard Randall, to Sybron Corporation. Volumetric measuring system. 3,851,530, Cl. 73-395.000.

Syntex Corporation: *See—*
Fried, John H.; and Harrison, Ian T., 3,852,363.

Synthelabo: *See—*
Giudicelli, Don Pierre Rene Lucien; and Gabriel, Jean-Pierre Rene, 3,852,453.

Syva Corporation: *See—*
Rubenstein, Kenneth E.; and Ullman, Edwin F., 3,852,157.

Szabo, Andras I.; and Tarli, Dan V., to Westinghouse Electric Corporation. Position indicator employing magnetic circuits to monitor the position of a magnetically permeable member movable along an axis having one degree of freedom. 3,852,661, Cl. 324-34.0s.

Sze, Morgan C.; and Snell, George J., to Lummus Company, The. Coal liquefaction. 3,852,182, Cl. 208-8.000.

Szpur, Roman, to Vital Research & Development, Inc. Fluid treatment system. 3,852,196, Cl. 210-133.000.

Tabata, Yasuhiro; and Ukai, Takeshi, to Ricoh Co., Ltd. Electrophotographic copying machine. 3,851,963, Cl. 355-3.00r.

Tachibana, Kameo: *See—*
Yaguchi, Hiromichi; Tachibana, Kameo; and Matsumoto, Tetsuo, 3,852,126.

Tachibana, Koichi: *See—*
Mihara, Shigetoshi; Inaba, Yanosuke; Tachibana, Koichi; Endo, Tomio; and Yasui, Eiichiro, 3,852,504.

Tadokoro, Takayo, to Tsukishima Kikai Co., Ltd. Driving device for rotary chemical machine. 3,851,819, Cl. 233-24.000.

Taguchi, Tatsuya; Lura, Yukio; and Takishima, Yoshiyuki, to Canon Kabushiki Kaisha. Electric shutter for single lens reflex camera. 3,852,774, Cl. 354-24.000.

Taiyo Yuden Kabushiki Kaisha: *See—*
Kimura, Seiichi; Suzuki, Talao; and Nakajima, Masahiro, 3,852,699.

Takahashi, Yukio, to Ikegai Tekko Kabushiki Kaisha. Apparatus for holding tip of band in strapping machine. 3,851,576, Cl. 100-33.0pb.

Takamatsu, Tasuto: *See—*
Ishii, Toshio; Takamatsu, Tasuto; Yurugi, Shojiro; and Masuda, Katsutada, 3,852,449.

Takeda Chemical Industries, Ltd.: *See—*
Ishii, Toshio; Takamatsu, Tasuto; Yurugi, Shojiro; and Masuda, Katsutada, 3,852,449.
Ninomiya, Nobutaka; and Kunii, Daizo, 3,852,216.

Takeda, Masashi, to Sony Corporation. Transistor circuit. 3,852,688, Cl. 332-31.00t.

Takemura, Satoshi; Harakon, Katsuyuki; Maeda, Mitsuaki; Sakai, Noboru; and Hamano, Etsuko, to Bridgestone Tire Company Limited. Pneumatic tires. 3,851,692, Cl. 152-361.00r.

Takemura, Satoshi; Harakon, Katsuyuki; Maeda, Mitsuaki; Sakai, Noboru; and Hamano, Etsuko, to Bridgestone Tire Company Limited. Radial tire. 3,851,693, Cl. 152-361.0dm.

Takeuchi, Shinjiro: *See—*
Ichioka, Satoshi; Onishi, Kazuo; Inoue, Tadashi; Ono, Hirohisa; and Takeuchi, Shinjiro, 3,852,525.

Takishima, Yoshiyuki: *See—*
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Tamura, Shukichi, to Yamasa Shoyu Kabushiki Kaisha. Uridine-5-di phosphate-glucuronic acid compositions. 3,852,435, Cl. 424-180.000.

Tamura, Shunkichi, to Yamasa Shoyu Kabushiki Kaisha. Uridine-5-monophosphate compositions. 3,852,433, Cl. 424-180.000.

Tanaka, Haruo: *See—*
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Tanaka, Shoichi; Kousaka, Susumu; and Kimura, Toshio. Process for the preparation of polyvinyl alcohol fibers. 3,852,402, Cl. 264-185.000.

Tanner, Chase. S., Co.: *See—*
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Tarangul, Emil V., to Chesebrough-Pond's Inc. Topical compositions containing petrolatum and hydrophobic starch. 3,852,475, Cl. 424-361.000.

Tarli, Dan V.: *See—*
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Tarro, Richard E. Method and means for selecting cosmetics. 3,851,655, Cl. 132-83.000.

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Tauern, Dankmar,, to Hilti Aktiengesellschaft. Stud welding apparatus. 3,852,559, Cl. 219-98.000.

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Taylor, Leonard, to Schermuly Limited. Pyrotechnic devices. 3,851,588, Cl. 102-37.800.

Taylor, Vincent J.: *See—*
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Taylor, William H.: *See—*
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Teach, Eugene G., to Stauffer Chemical Company. Ether and sulfide meta-substituted phenyl ureas. 3,852,348, Cl. 260-553.00a.

Teahan, Teresa C. Mathematical educational device. 3,851,409, Cl. 35-31.00f.

Technicon Instruments Corporation: *See—*
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Ted-Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec: *See—*
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Tee-Pak, Inc.: *See—*
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Teijin Limited: *See—*
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Telesco Brophey Limited: *See—*
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Telfer, Thomas Andrew, to General Electric Company. Microwave transmission line to ground plane transition. 3,852,690, Cl. 333-84.00m.

Terazawa, Yasuto, to Toyo Kogyo Co. Ltd. Rotor housing structure for rotary piston engine. 3,851,627, Cl. 123-8.090.

Terzic, Brant: *See—*
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Tesa S.A.: *See—*
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Teshirogi, Naohisa; and Nakahara, Hiroo, to Agency of Industrial Science & Technology. Method for controlling noxious components of exhaust gas from diesel engine. 3,851,632, Cl. 123-119.00a.

Teutsch, Edward G.: *See—*
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Theobald, Eugene J. Combination lock for engine starters. 3,851,504, Cl. 70-255.000.

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Thermo-O-Disc Incorporated: *See—*
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Thompson, Charles T.; and Thompson, Bobby J., to American Coldset Corporation. Stabilized under-drilling apparatus. 3,851,719, Cl. 175-406.000.
Thompson, James Gordon, to Key Oilfield Supply & Rentals Ltd. Mud and shale separating apparatus. 3,852,197, Cl. 210-143.000.
Thompson, Tom H. Brake mechanism. 3,851,567, Cl. 92-42.000.
Thomson, Lois J.; formerly Duggan, Lois J.; as trustees of the estate of Magnuson, Roy M.; deceased: *See—*
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Ticino, Vezia: *See—*
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Tilk, Tonis, to United States of America, Army. Method and apparatus for synchronizing pseudorandom coded data sequences. 3,852,534, Cl. 179-15.0bs.
Tilse, Wilhelm, to Timex Corporation. Balance wheel. 3,851,461, Cl. 58-107.000.
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Titov, Dmitry Vladimirovich; Rotenburg, Alexandr Aronovich; and Pevzner, Leonid Mikhailovich. Device for retaining the end of a weft thread in looms. 3,851,679, Cl. 139-194.000.
Titus, Charles H., to General Electric Company. Protective system for mobile electric power apparatus. 3,852,641, Cl. 317-18.00b.
Toby, Daniel J., to Toby Enterprises. Surface freezing a shaped piece of meat. 3,852,507, Cl. 426-513.000.
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Tomita, Tamaki; and Ochiai, Yoshiki, to Toyoda Koki Kabushiki Kaisha. Tool mounting device for a machine tool. 3,851,562, Cl. 90-11.00a.
Tomlinson, Peter E., to Du Pont de Nemours, E. I., and Company. Process for isomerization of 2-methyl-3-butene-nitrile to a linear pentenenitrile. 3,852,329, Cl. 260-465.900.
Toole, Joseph G.; and Foy, Wade H. Method and apparatus for determining ternal impedance of animal body part. 3,851,641, Cl. 128-21.00z.
Torii, Keiichi: *See—*
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Turner, James, to AGFA-Gevaert Aktiengesellschaft. Apparatus for guiding the edges of webs in photographic copying apparatus or the like. 3,851,811, Cl. 226-199.000.
Turner, John O.; and Norton, Richard V., to Sun Ventures, Inc. Reaction of peroxides with nitriles. 3,852,349, Cl. 260-558.00r.
Turner, Trevor Stanley; and Whittle, John Edward, to International Nickel Company, Inc., The. Activation of nickel battery plates. 3,852,112, Cl. 136-29.000.
Turpin, Charles H., to Pillsbury Company, The. Dough package containing triple sealed icing cup and method of producing the same. 3,851,757, Cl. 206-223.000.
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Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Camera outfit for connecting a flash unit to a photographic camera. 3,852,788, Cl. 354-293.000.
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Upmeier, Hartmut. Extruder for plastics material, particularly thermoplastic or non-cross-linked elastomeric materials. 3,852,013, Cl. 425-376.000.
Urbach, Jacques, to Uroptics International Incorporated. Process for sterilizing hydrophilic gelatin lenses having ultraviolet stabilizers. 3,852,032, Cl. 21-54.00r.
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Usab, Martin A., to Georg Fischer Aktiengesellschaft. Pipe cleaning and priming apparatus. 3,851,617, Cl. 118-3.000.
Usamoto, Teruyoshi; Hatada, Yasutaka; Furuichi, Itsuro; and Matsuo, Masao, to Sumitomo Chemical Company, Limited. Higher alkyl thiuram sulfide. 3,852,354, Cl. 260-567.000.
Usdin, Myron G., to Richardson-Merrell Inc. Equine strangles vaccine and method of preparing and using the same. 3,852,420, Cl. 424-92.000.
Utner, Ferdinand. Method for the production of plastic. 3,851,750, Cl. 198-131.000.
Utschig, Peter: *See—*
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Van Der Roer, Humphrey Alphons Victor, to Polytype AG. Device for transferring workpieces from a stationary supply source to a moving machine. 3,851,747, Cl. 198-22.00r.
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Van Paesschen, August Jean; and Herbots, Joseph Antoine, to AGFA Gevaert Mortsel. Application of magnetic recording strips to motion picture film. 3,852,069, Cl. 96-39.000.
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Van Werven, Ferdinand Maria; and Bohlmeyer, Frits Peter, to Lever Brothers Company. Meat paste product and process for preparing same. 3,852,487, Cl. 426-149.000.

Van Winkle, Terry L.: *See—*
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Vandervoorde, Jacques Pierre, to Hoffmann-La Roche Inc. Compositions for use in radioimmunoassay as a substitute for blood plasma extract in determination of carcinoembryonic antigen. 3,852,415, Cl. 424-1.000.

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Vega, Raul Antonio. Columns of record throwers of the automatic record players. 3,851,887, Cl. 274-10.00s.

Velo-Bind, Inc.: *See—*
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Venema, Gerard J., to Nalco Chemical Company. Process and apparatus for dissolving water soluble polymers and gums in water involving inversion of water-in-oil emulsions. 3,852,234, Cl. 260-29.60h.

Venter, Peter Jacobus; and Malan, Johannes Daniel. Recovering flavor and aroma substances from fermeation gases. 3,852,477, Cl. 426-15.000.

Verboven, Ghislain Felix Alfons Arthur: *See—*
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Verdouw, Albert J., to General Motors Corporation. Annular dilution zone combustor. 3,851,465, Cl. 60-39.360.

Verdouw, Albert J., to General Motors Corporation. Combustion apparatus. 3,851,466, Cl. 60-39.360.

Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
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Vermeulen, Marinus Cornelus: *See—*
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Victor Company of Japan: *See—*
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Vidal, Lucien Rene. Drag lines for concrete. 3,851,749, Cl. 198-36.000.

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Vierstraete, Jean. Cutting apparatus with work clamp. 3,851,557, Cl. 83-453.000.

Vihma, Johannes, to Artistic Woodwork Co., Ltd. Picture frame. 3,851,415, Cl. 40-152.000.

Vilkas, Michel; and Senechal, Guy, to L'Air Liquide Societe Anonyme pour l'Etude et Exploitation des Procedes Georges Claude. Preparation of hydroxycitronellal. 3,852,360, Cl. 260-602.000.

Villari, Frank K., to Kendall Company, The. Catheterization package. 3,851,649, Cl. 128-275.000.

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Wagner, Richard A.; Reid, Paul A.; Teutsch, Edward G.; and McVeen, Milford D., to Towmotor Corporation. Mast and carriage for a lift truck. 3,851,732, Cl. 187-9.000.
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Wilkin, Douglas G. Push-pull type exercising device. 3,851,874, Cl. 272-81.000.
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Carroll, Max L., Jr. Process for preparing extruded cellulosic film and sheeting having excellent optical properties. T929,002, 12–3–74, Cl. 260—224.

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Czarnecki, Ronald F. Straight dough baking process. T929,007, 12–3–74, Cl. 426—24.

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Hopfner, Clemens, and W. Ort. Reel adapter for a cartridge. T929,004, 12–3–74, Cl. 242—71.

Lee, Louis J. Baking method. T929,006, 12–3–74, Cl. 426—24.

Madderra, Galen K.: *See*—
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Van Cleeff, Albertus, to E. I. du Pont de Nemours & Co. Fast-draining neoprene-asbestos fiber slurries. T929,008, 12–3–74, Cl. 162—155.

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ISSUED DECEMBER 3, 1974

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95 3,851,736

CLASS 188

71.9 3,851,737
244 3,851,738

CLASS 192

3.57 3,851,739
67A 3,851,740
85R 3,851,741
103F 3,851,742

CLASS 193

2C 3,851,743

CLASS 194

4R 3,851,744

CLASS 195

1.8 3,852,155
28N 3,852,156
63 3,852,157
100 3,852,158

CLASS 197

6.1 3,851,745
144 3,851,746

CLASS 198

22R 3,851,747
34 3,851,748
36 3,851,749
131 3,851,750
179 3,851,751
192 3,851,752
229 3,851,753

CLASS 200

31R 3,852,542
61.27 3,852,543
80R 3,852,545
82R 3,852,544
83C 3,852,546
83Y 3,852,547
144B 3,852,555
148A 3,852,551
148B 3,852,550
148F 3,852,548
148R 3,852,549
153G 3,852,552
3,852,553
156 3,852,554
241 3,852,557
310 3,852,556

CLASS 202

227 3,852,159

CLASS 203

6 3,852,160
3,852,161
10 3,852,162
47 3,852,163
91 3,852,164

CLASS 204

1T 3,852,169
28 3,852,170
38A 3,852,171
56R 3,852,172
67 3,852,173
73R 3,852,174
98 3,852,175
129.46 3,852,176
159.17 3,852,177
186 3,852,178
256 3,852,179
277 3,852,180
298 3,852,181

CLASS 206

.82 3,851,755
216 3,851,756
223 3,851,757
328 3,851,758
338 3,851,759
411 3,851,761
425 3,851,762
549 3,851,754

CLASS 208

8 3,852,182
10 3,852,183
58 3,852,207
64 3,852,184
89 3,852,185
3,852,186
3,852,187
114 3,852,188
120 3,852,189
138 3,852,190
216 3,852,165
347 3,852,166

CLASS 209

166 3,852,167
419 3,851,763
469 3,852,168

CLASS 210

63 3,852,192
71 3,852,191
73 3,852,193
83 3,852,194
94 3,852,195
133 3,852,196
143 3,852,197
321 3,852,198
522 3,852,199

CLASS 211

1.5 3,851,764
184 3,851,765

CLASS 212

20 3,851,766
48 3,851,767

CLASS 213

43 3,851,768

CLASS 214

1BB 3,851,771
1BC 3,851,769
1Q 3,851,772
2.5 3,851,770
6.5 3,851,773
17DA 3,851,774
18R 3,851,775
142 3,851,776
620 3,851,777
622 3,851,778
731 3,851,779
766 3,851,780

CLASS 215

11E 3,851,781
232 3,851,783
307 3,851,782
344 3,851,784

CLASS 219

10.49 3,852,558
98 3,852,559
121EB 3,852,560
125R 3,852,561
3,852,562
216 3,852,563
241 3,852,565
311 3,852,566
365 3,852,567
375 3,852,568
522 3,852,564
525 3,852,569
528 3,852,570

CLASS 220

2.2 3,851,785
3 3,851,786
85R 3,851,790
89B 3,851,791
253 3,851,792
270 3,851,793
273 3,851,787
307 3,851,789
308 3,851,794
319 3,851,788

CLASS 222

1 3,851,795
39 3,851,796
129.4 3,851,797
135 3,851,798
145 3,851,799
3,851,800
146HE 3,851,801
162 3,851,802
182 3,851,803
413 3,851,804
534 3,851,805
555 3,851,806

CLASS 223

2 3,851,807

CLASS 224

48R 3,851,808

CLASS 225

20 3,851,809

CLASS 226

91 3,851,816
121 3,851,810
199 3,851,811

CLASS 229

5.5 3,851,812
17G 3,851,813
53 3,851,814
87R 3,851,815

CLASS 233

11 3,851,817
22 3,851,818
24 3,851,819

CLASS 235

61.11E 3,852,572
3,852,573
61.7B 3,852,571
92FL 3,852,577
92GA 3,852,576
92PL 3,852,574
92T 3,852,575
151.1 3,852,578
151.3 3,852,579
152 3,852,580
164 3,852,581

CLASS 238

230 3,851,821

CLASS 239

2R 3,851,822
102 3,851,823
132.3 3,851,824
407 3,851,820
590.3 3,851,825

CLASS 240

1.3 3,852,582
41.35R 3,852,583
3,852,584
57 3,852,585
3,852,586
60 3,852,587
108R 3,852,588

CLASS 241

46.11 3,851,826
65 3,851,827
68 3,851,828
188R 3,851,829

CLASS 242

7.03 3,851,830
7.22 3,851,831
55.53 3,851,760
66 3,851,832
68.3 3,851,833
3,851,834
107.4 3,851,835
3,851,837
107.7 3,851,836
118.32 3,851,838
147R 3,851,839
198 3,851,840
199 3,851,841
3,851,842

CLASS 243

19 3,851,843

CLASS 244

3.16 3,851,844
129D 3,851,845

CLASS 248

188.2 3,851,846
231 3,851,847
273 3,851,848
503 3,851,849

CLASS 249

194 3,851,850

CLASS 250

202 3,852,590
211J 3,852,591
221 3,852,592
259 3,852,593
278 3,852,594
288 3,852,595
310 3,852,596
311 3,852,597
327 3,852,598
328 3,852,599
337 3,852,589
360 3,852,600
366 3,852,601
369 3,852,602
3,852,603
373 3,852,604
385 3,852,610
401 3,852,605
445 3,852,611
492 3,852,612
551 3,852,606

CLASS 251

25 3,851,851
149.1 3,851,852
214 3,851,853

CLASS 252

8.5A 3,852,200
3,852,201
8.55R 3,852,202
12 3,852,203
33.4 3,852,204
47.5 3,852,205
48.8 3,852,206
62.1 3,852,208
95 3,852,209
3,852,210
110 3,852,211
135 3,852,212
181 3,852,213
403 3,852,214
421 3,852,216
441 3,852,215
442 3,852,217
3,852,218
522 3,852,219
524 3,852,220
548 3,852,221

CLASS 254

7C 3,851,854
86R 3,851,855
93R 3,851,856
134 3,851,857

CLASS 256

59 3,851,858

CLASS 259

6 3,851,859
55 3,851,860
72 3,851,861
177R 3,851,862
191 3,851,863

CLASS 260

2EP 3,852,222
2.3 3,852,223
2.5M 3,852,224
5 3,852,225
18N 3,852,226
23H 3,852,227
23.7M 3,852,228
3,852,229
28 3,852,230
28.5R 3,852,231
29.3 3,852,232
29.6TA 3,852,233
29.6H 3,852,234
32.4 3,852,235
42.18 3,852,236
42.21 3,852,237
45.75R 3,852,238
46.5R 3,852,239
47CZ 3,852,241
3,852,242
47EP 3,852,240
50 3,852,243
3,852,244
59 3,852,245
75N 3,852,246
75R 3,852,247
78TF 3,852,248
78.5R 3,852,249
79.5B 3,852,250
3,852,251
85.1 3,852,252
85.3H 3,852,253
85.5R 3,852,254
88.7R 3,852,255
89.3 3,852,256
89.5AW 3,852,257
93.7 3,852,258
94.1 3,852,259
112R 3,852,260
156 3,852,261
205 3,852,262
3,852,263
210AB 3,852,264
210.5 3,852,265
211.5R 3,852,266
3,852,267
3,852,268
239B 3,852,269
239.3A 3,852,272
3,852,273
239.3D 3,852,270
3,852,271
3,852,274
239.9 3,852,275
240A 3,852,278
240F 3,852,279
3,852,280
240J 3,852,277
240R 3,852,276
243C 3,852,281
3,852,282
3,852,283
244R 3,852,284
247.1T 3,852,287
247.1 3,852,285
247.2R 3,852,286
247.7D 3,852,288
247.7K 3,852,296
248AS 3,852,289
251R 3,852,290
256.4C 3,852,291
294.8D 3,852,293
295R 3,852,292
296M 3,852,294
297F 3,852,295
299 3,852,297
304 3,852,298
307F 3,852,299
308R 3,852,300
309 3,852,301
309.5 3,852,302
309.6 3,852,303
326.85 3,852,304
340.9 3,852,305
3,852,306
343.2F 3,852,307
346.4 3,852,308
347.7 3,852,309
348R 3,852,310
397.2 3,852,311
397.4 3,852,312
404.5 3,852,313
410.7 3,852,314
3,852,315
413 3,852,316
453P 3,852,317
455A 3,852,318
3,852,319
463 3,852,320
464 3,852,321
3,852,322
465D 3,852,323
3,852,324
465.6 3,852,326
465.9 3,852,325
3,852,327
3,852,328
3,852,329
468G 3,852,331
468H 3,852,330
471C 3,852,332
3,852,334
471R 3,852,333
484R 3,852,335
485J 3,852,336
488R 3,852,337
501.12 3,852,338
3,852,339
501.16 3,852,340
519 3,852,341
524R 3,852,342
3,852,343
534E 3,852,344
545R 3,852,345
546 3,852,346
553A 3,852,347
3,852,348
558R 3,852,349
562B 3,852,351
562P 3,852,350

563P 3,852,352
564B 3,852,353
567 3,852,354
586G 3,852,358
586R 3,852,355
3,852,356
3,852,357
590 3,852,359
602 3,852,360
603C 3,852,361
606.5P 3,852,362
613D 3,852,363
649R 3,852,364
650F 3,852,365
3,852,366
652.5R 3,852,367
657 3,852,368
680B 3,852,373
680E 3,852,369
3,852,370
683.47 3,852,371
683.68 3,852,372
839 3,852,374
850 3,852,375
862 3,852,376
873 3,852,393
3,852,394
953 3,852,395
957 3,852,396
968 3,852,397

CLASS 261

1 3,852,377
4 3,852,378
23A 3,852,379
27 3,852,380
50A 3,852,381
51 3,852,382
69R 3,852,383
3,852,391
77 3,852,384
121R 3,852,385

CLASS 264

40 3,852,386
3,852,387
41 3,852,388
46.4 3,852,389
53 3,852,390
89 3,852,392
94 3,852,398
117 3,852,399
154 3,852,400
182 3,852,401
185 3,852,402

CLASS 266

23T 3,851,864
35 3,851,865
41 3,851,866

CLASS 267

57.1 Re.28,259
120 3,851,867

CLASS 269

8 3,851,868
61 3,851,869
322 3,851,870

CLASS 271

11 3,851,871
173 3,851,872

CLASS 272

63 3,851,873
81 3,851,874

CLASS 273

1E 3,851,875
24 3,851,876
78 3,851,877
94R 3,851,878
120R 3,851,879
128R 3,851,880
131B 3,851,883
134AC 3,851,881
136B 3,851,885
136F 3,851,882
157R 3,851,884
197A 3,851,886

CLASS 274

10S 3,851,887

CLASS 277

206 3,851,888
214 3,851,889

CLASS 279

75 3,851,890

CLASS 280

11 3,851,891
11.35Y 3,851,892
112A 3,851,893
460R 3,851,894
467 3,851,895

CLASS 285

14 3,851,896
18 3,851,897
24 3,851,898
95 3,851,899
112 3,851,901
231 3,851,900
334.2 3,851,902
341 3,851,903

CLASS 289

15 3,851,904

CLASS 292

11 3,851,905
111 3,851,922
256.73 3,851,906
262 3,851,907
3,851,908

CLASS 293

70 3,851,909
84 3,851,911
89 3,851,910

CLASS 296

35R 3,851,912
3,851,913

CLASS 297

45 3,851,914
56 3,851,915
188 3,851,916
345 3,851,917
357 3,851,918
395 3,851,919
455 3,851,920

CLASS 299

37 3,851,921

CLASS 301

37T 3,851,923

CLASS 302

28 3,851,924
3,851,925
29 3,851,926
60 3,851,927

CLASS 303

21CG 3,851,928
21F 3,851,929
3,851,930

CLASS 305

54 3,851,931
58 3,851,932

CLASS 307

10AT 3,852,614
10R 3,852,613
116 3,852,615
233 3,852,616
235 3,852,617
252Q 3,852,618
268 3,852,619
3,852,620
273 3,852,621
3,852,622
293 3,852,623
295 3,852,624
304 3,852,625

CLASS 308

9 3,851,933
15 3,851,934
73 3,851,935

CLASS 310

13 3,852,626
3,852,627
68D 3,852,628

CLASS 312

108 3,851,936
111 3,851,937
117 3,851,938
138R 3,851,939
234.5 3,851,940
333 3,851,941
3,851,942
347 3,851,943

CLASS 313

152 3,852,629
201 3,852,607
228 3,852,630
318 3,852,631
380 3,852,632
411 3,852,633
422 3,852,634
449 3,852,608

CLASS 315

3.5 3,852,635
5.54 3,852,636
16 3,852,637
27GD 3,852,640
39.61 3,852,638
84.6 3,852,639
169TV 3,852,609

CLASS 317

18B 3,852,641
18D 3,852,642
100 3,852,643
101C 3,852,644
113 3,852,645
141S 3,852,646
230 3,852,647

CLASS 318

221H 3,852,648
257 3,852,649
588 3,852,650
627 3,852,651

CLASS 320

35 3,852,652
64 3,852,653

CLASS 321

7 3,852,654
9 3,852,655
11 3,852,656
18 3,852,657

CLASS 323

16 3,852,658

CLASS 324

1 Re.28,264
6 3,852,659
28R 3,852,660
34PS 3,852,661
3,852,662
40 3,852,663
41 3,852,664
63 3,852,665
71CP 3,852,666
72 3,852,667
3,852,668

CLASS 325

151 3,852,669
357 3,852,670
492 3,852,671

CLASS 328

1 3,852,672
127 3,852,673
3,852,674
138 3,852,675

CLASS 329

103 3,852,676
109 3,852,677

CLASS 330

15 3,852,678
30D 3,852,679
34 3,852,680

CLASS 331

1R 3,852,681
4 3,852,682
94.5D 3,852,685
94.5L 3,852,683
94.5 3,852,684
177V 3,852,686

CLASS 332

11R 3,852,687
31T 3,852,6 8

CLASS 333

10 3,852,689
84M 3,852,690

CLASS 334

19 3,852,691

CLASS 335

205 3,852,692
212 3,852,693

CLASS 337

62 3,852,694
102 3,852,695
240 3,852,696
348 3,852,697
354 3,852,698

CLASS 339

14R 3,852,700
14T 3,852,699
19 3,851,944
64M 3,852,701
97C 3,851,945
97R 3,852,702
198H 3,852,703
252P 3,852,704
259R 3,851,946

CLASS 340

3R 3,852,705
6R 3,852,706
3,852,707
7R 3,852,708
15.5DS 3,852,709
27AT 3,852,710
27R 3,852,711
52F 3,852,712
58 3,852,717
146.3F 3,852,714
146.3Z 3,852,715
164R 3,852,713
3,852,718
172.5 3,852,716
3,852,719
3,852,720
3,852,721
3,852,722
173RC 3,852,724
173R 3,852,723
174BC 3,852,725
188R 3,852,726
213R 3,852,727
227R 3,852,728
228.2 3,852,729
237R 3,852,730
248B 3,852,731
249 3,852,732
251 3,852,733
253R 3,852,734
258C 3,852,735
274R 3,852,737
279 3,852,736
310 3,852,738
347AD 3,852,739
416 3,852,740

CLASS 343

5R 3,852,741
7.7 3,852,742
8 3,852,743
9 3,852,744
17 3,852,745
17.2PC 3,852,746
18E 3,852,747
100AM 3,852,748
102 3,852,749
105R 3,852,750
3,852,751
108M 3,852,752
113R 3,852,753
3,852,754
701 3,852,755
708 3,852,756
713 3,852,757
718 3,852,758
729 3,852,759
747 3,852,760
754 3,852,761
756 3,852,762
761 3,852,763
778 3,852,764
781 3,852,765
844 3,852,766

CLASS 346

1 3,852,767
49 3,852,769
74ES 3,852,770
74E 3,852,771
75 3,852,768
3,852,772
140 3,852,773

CLASS 350

3.5 3,851,948
18 3,851,949
103 3,851,947
125 3,851,950
161 3,851,951
187 3,851,952
215 3,851,953

CLASS 351

7 3,851,954

CLASS 352

60 3,851,955
91C 3,851,956
123 3,851,957
130 3,851,958
177 3,851,959

CLASS 353

27 3,851,960
38 3,851,961

CLASS 354

14 3,852,775
24 3,852,774
31 3,852,776
49 3,852,777
51 3,852,778
3,852,779
86 3,852,780
3,852,781
110 3,852,782
145 3,852,790
152 3,852,791
174 3,852,783
206 3,852,784
213 3,852,792
239 3,852,785
252 3,852,786
275 3,852,787
293 3,852,788
324 3,852,793
339 3,852,789

CLASS 355

3R 3,851,962
3,851,963
10 3,851,964
15 3,851,965
17 3,851,966
77 3,851,967
132 3,851,968
3,851,969

CLASS 356

51 3,851,970
71 3,851,971
72 3,851,972
106LR 3,851,973
153 3,851,974
198 3,851,975
206 3,851,976

CLASS 357

3 3,852,794
5 3,852,795
16 3,852,796
19 3,852,797
3,852,798
23 3,852,799
24 3,852,800
3,852,801
27 3,852,802
82 3,852,803
3,852,804
3,852,805
3,852,806

CLASS 358

8 3,852,808
9 3,852,520
28 3,852,807

CLASS 360

40 3,852,809
51 3,852,810
3,852,811
66 3,852,812
3,852,813
72 3,852,814
75 3,852,815
86 3,852,816
88 3,852,817
92 3,852,818
3,852,819
99 3,852,820

CLASS 403

16 3,851,977
45 3,851,978
76 3,851,979
172 3,851,980
224 3,851,982
237 3,851,981
312 3,851,983
322 3,851,984
362 3,851,985
373 3,851,986
374 3,851,987

CLASS 404

50 3,851,989
129 3,851,988

CLASS 408

1 3,851,990
37 3,851,991
54 3,851,992

CLASS 415

53 3,851,993

CLASS 416

223 3,851,994

CLASS 417

12 3,851,995
61 3,851,996
112 3,851,997
199A 3,851,998

CLASS 418

61R 3,852,002
93 3,852,003
131 3,852,004
142 3,851,999
156 3,852,000
196 3,852,001

CLASS 423

18 3,852,403
99 3,852,404
118 3,852,405
219 3,852,406
240 3,852,407
242 3,852,408
3,852,409
244 3,852,410
329 3,852,411
390 3,852,412
422 3,852,427
447 3,852,428
449 3,852,429
481 3,852,430
549 3,852,431

CLASS 424

1 3,852,413
3,852,414
3,852,415
14 3,852,416
47 3,852,417
75 3,852,418
84 3,852,419
92 3,852,420
94 3,852,421
100 3,852,422
115 3,852,423
118 3,852,424
119 3,852,425
120 3,852,426
145 3,852,432
180 3,852,433
3,852,434
3,852,435
195 3,852,436
200 3,852,437
217 3,852,438
219 3,852,439
239 3,852,440
245 3,852,441
3,852,442
3,852,444
250 3,852,443
3,852,445
3,852,446
3,852,447
3,852,448
251 3,852,449
3,852,450
253 3,852,451
258 3,852,452
262 3,852,453
263 Re.28,263
3,852,454
267 3,852,455
3,852,456
269 3,852,457
270 3,852,458
273 3,852,459
3,852,460
3,852,461
279 3,852,462
300 3,852,463
301 3,852,464
305 3,852,465
318 3,852,466
319 3,852,467
3,852,469
324 3,852,468
331 3,852,470
334 3,852,471
342 3,852,472
343 3,852,473
352 3,852,474
361 3,852,475

CLASS 425

28P 3,852,008
47 3,852,006
66 3,852,007
83 3,852,009
119 3,852,005
192 3,852,010
242R 3,852,011
363 3,852,012
376 3,852,013
388 3,852,014
392 3,852,015
393 3,852,016
451 3,852,017
472 3,852,018

CLASS 426

7 3,852,476
14 3,852,495
15 3,852,477
41 3,852,496
42 3,852,478
44 3,852,479
46 3,852,480
65 3,852,481
3,852,482
69 3,852,498
74 3,852,497
93 3,852,499
94 3,852,483
104 3,852,484
106 3,852,485
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D6—	31	233,807		70	233,817		71	233,827		19	233,836	D34—	4C	233,846		J	233,856
		233,808		181	233,818		160	233,828		67	233,837		5CB	233,848	D64—	11A	233,858
		233,809		193	233,819		164	233,829		141	233,838		PP	233,847	D67—	3B	233,859
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	3,852,724		3,852,527		3,852,616		3,852,154	55 :	3,851,396		3,852,280
	3,852,752	50 :	3,851,525		3,852,720		3,852,243		3,851,609		3,852,378
	3,852,772		3,851,968	52 :	3,852,015		3,852,460		3,851,650		3,852,554
	3,852,800	51 :	3,851,348	53 :	3,851,431		3,852,672		3,851,671		3,852,557
49 :	3,851,888		3,851,783		3,851,436		3,852,708		3,851,681		3,852,604
	3,852,044		3,852,222		3,851,639		3,852,718		3,851,789		3,852,727
	3,852,106		3,852,523		3,851,689	54 :	3,851,434		3,851,862	56 :	3,851,848
	3,852,526		3,852,532		3,852,045		3,851,560				

Design Patents

6 :	233,810		233,851		233,858	27 :	233,823	37 :	233,822		233,859
	233,813		233,853	18 :	233,855		233,824	39 :	233,828	42 :	233,820
	233,821		233,856	21 :	233,838	29 :	233,860		233,833		233,837
	233,825	8 :	233,819	24 :	233,830	30 :	233,850		233,840		233,847
	233,835		233,857	25 :	233,846	34 :	233,849		233,844	51 :	233,864
	233,839	9 :	233,809		233,862	36 :	233,829		233,848	55 :	233,834
	233,842		233,812	26 :	233,831		233,843		233,852		233,863
	233,845	17 :	233,826								

Defensive Publications Applications

[Notice of Dec. 16, 1969, 869 O.G. 6877]

10 :	T929,008	40 :	T929,001	47 :	T929,002	T929,003	T929,006	T929,007
39 :	T929,005							

U. S. GOVERNMENT PRINTING OFFICE : O - 1974

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